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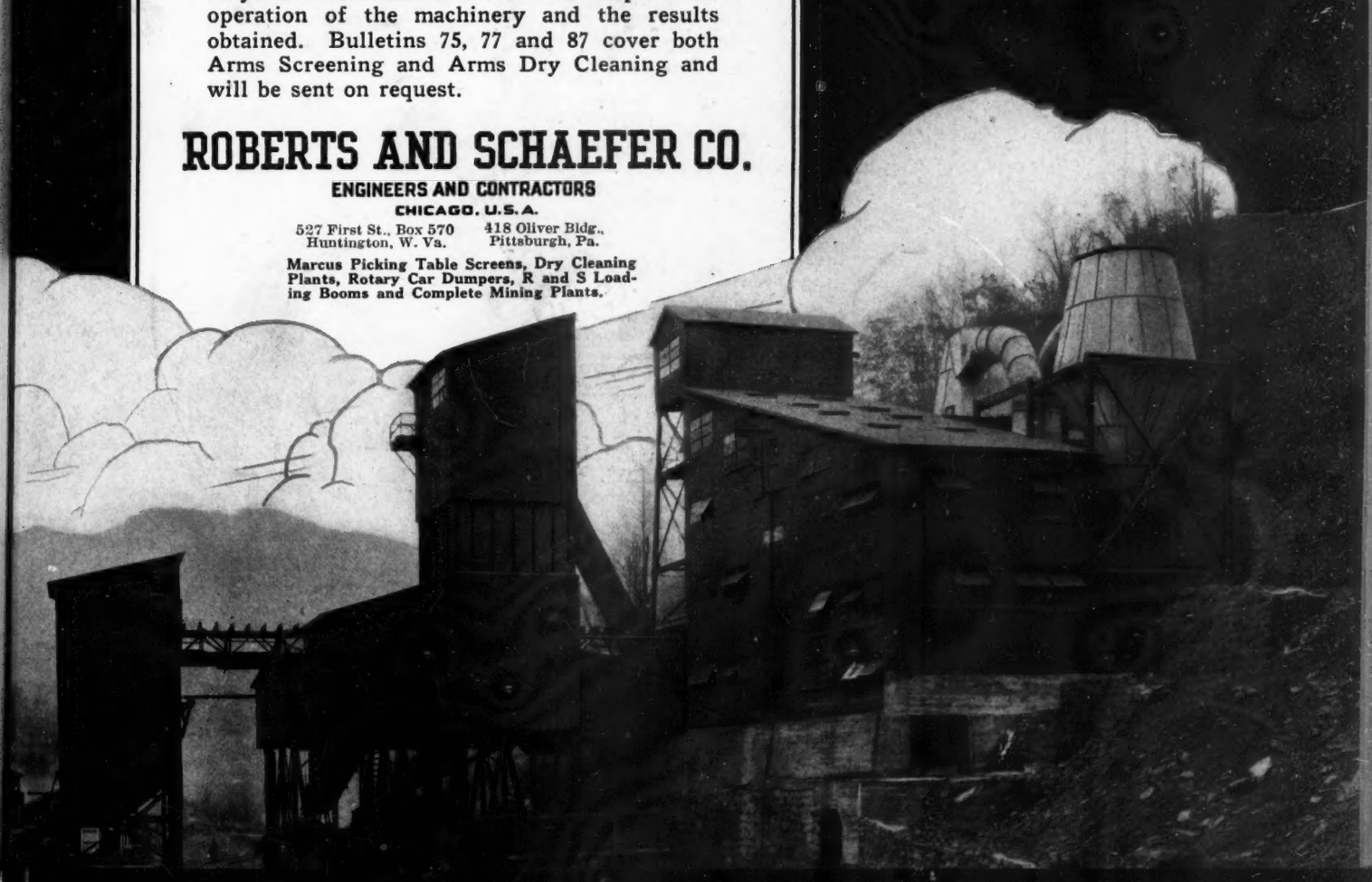

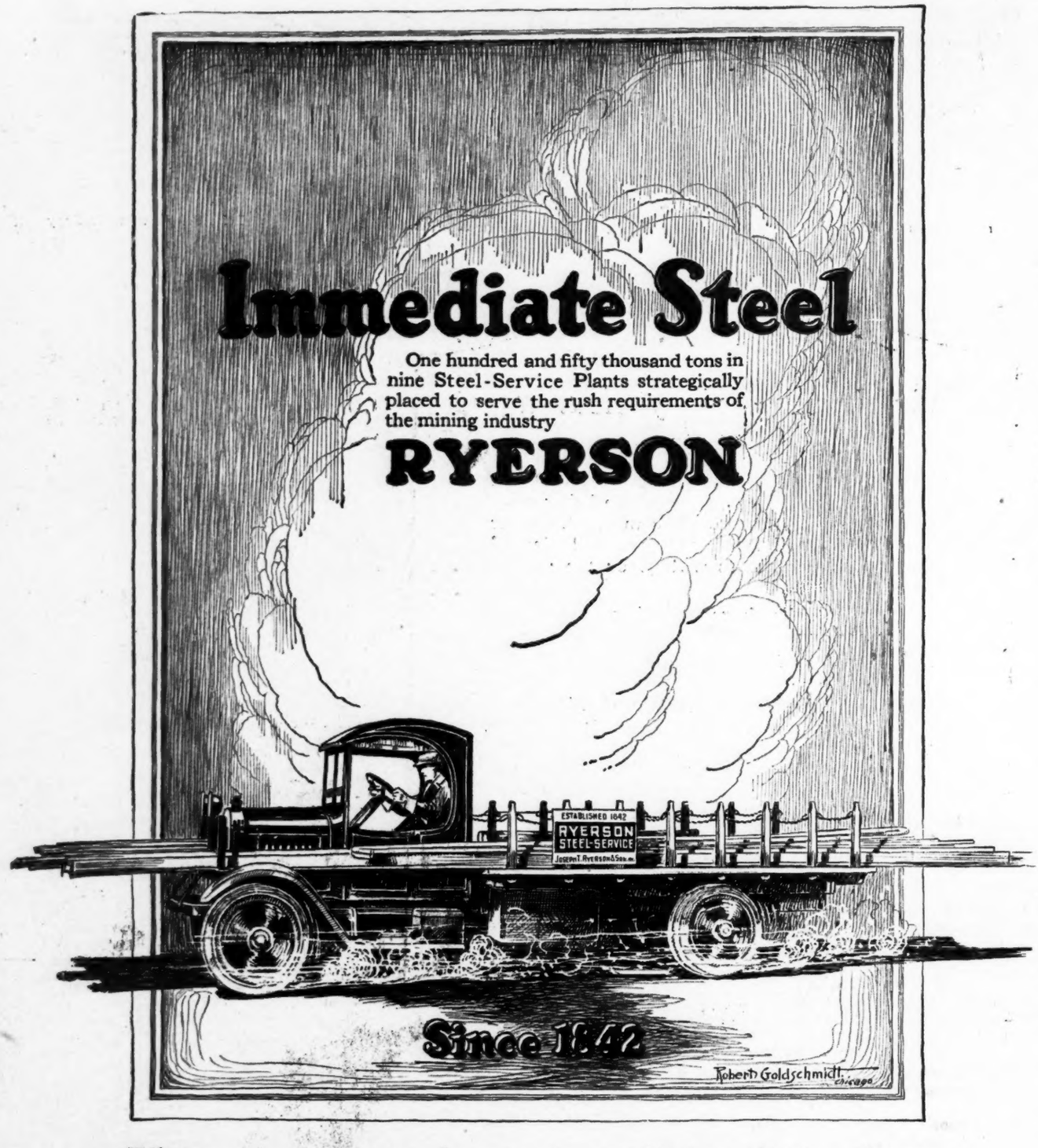
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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

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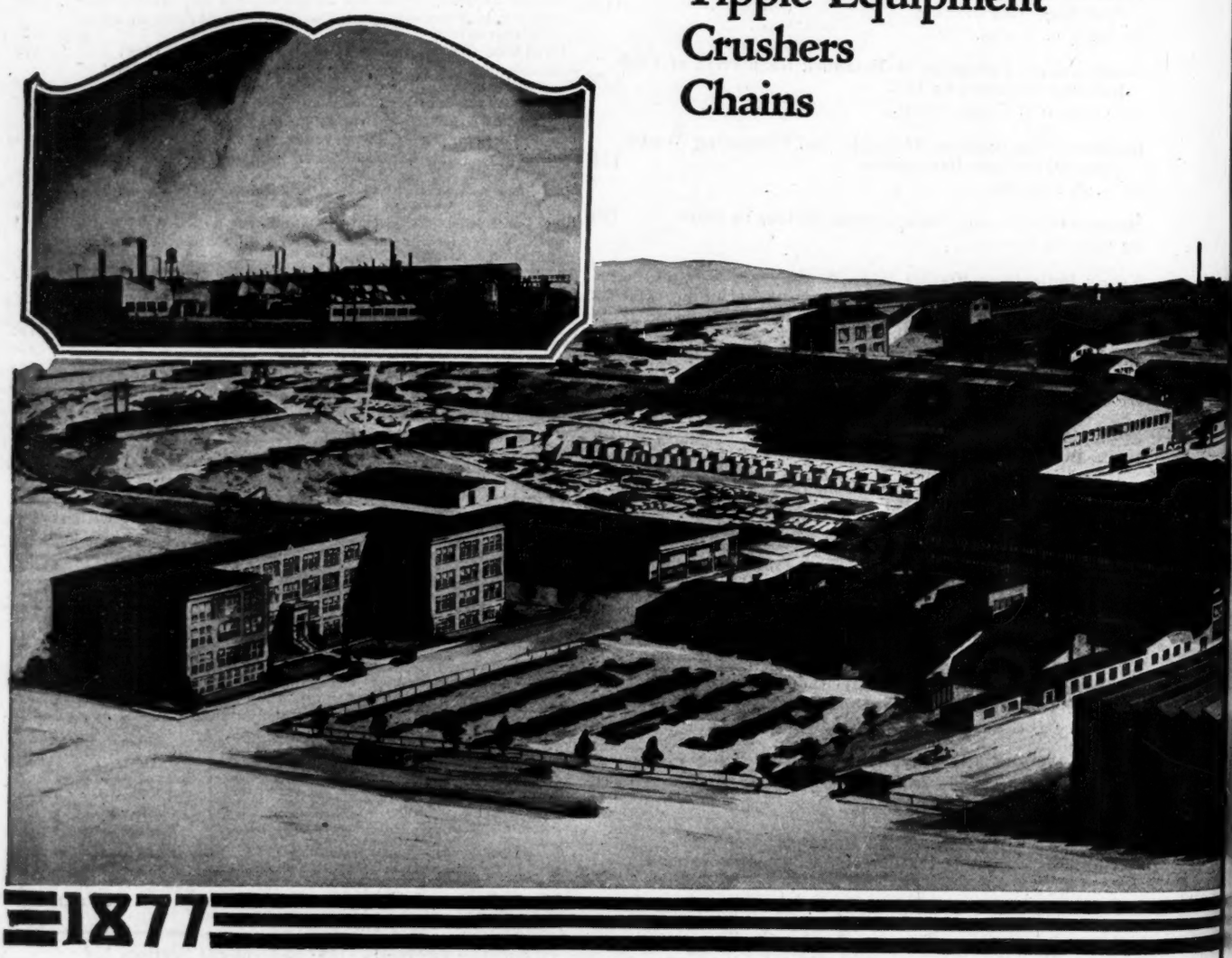

1877

COAL AGE

McGRAW-HILL PUBLISHING COMPANY, INC.
JAMES H. McGRAW, *President*
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Devoted to the Operating, Technical and Business Problems of the Coal-Mining Industry

R. DAWSON HALL
Engineering Editor

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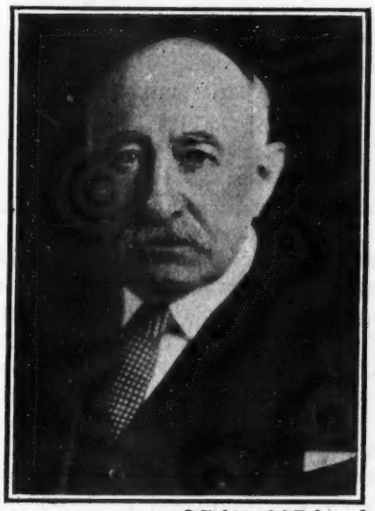
FOREWORD



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JOHN HAYS HAMMOND

BY DEVELOPING new uses for coal the present outlook, made disheartening by excess capacity and the competition of substitutes, can be transformed into a vista of great promise.

Research into the methods of using coal will enable it to compete successfully with water power and oil. One of these days a household furnace will be devised which will burn the small sizes of bituminous coal. It will be controlled by thermostats. It will be stoked automatically and ash disposal will be accomplished without inconvenience. The coal producers should encourage research on these problems. If they are solved the domestic market lost to oil can be recovered quickly.

Before long we will be keeping cool with coal in the summer. The producers of coal have an opportunity there to hasten the day when the householder will become a year-around purchaser of coal.

That half a dozen ways of converting coal into oil are promisingly near commercial success was revealed at the recent conference in Pittsburgh on the utilization of coal. The industry could afford to go far in financing the study of that development which, when successful, will provide a new market for millions of tons of their product.

Application to coal of the enterprise displayed in the creation of a market for electrical appliances and in the development of new markets for copper and zinc would bear fruit.

By improving handling facilities at ports, by requiring a high quality standard and by minimizing breakage the export market for American coal can be expanded.

Excess capacity can be reduced by co-operative action. Much can be done toward that end if systematic steps are taken to educate the producers and those who finance them. If the industry thinks some legal sanction is required for such co-operative measures, its leaders will be surprised at the friendly reception which will be accorded such a request. The public has no inborn hostility to coal operators. Where consolidations are obviously in the interest of all concerned the consent of the public will not be withheld.

Building up of demand and the absorption of excess capacity are the roads to prosperity and peace in the coal industry. They will be easier to follow if everything is done to cultivate the best possible relations with the public. The first step is to recognize frankly the public's interest by adopting a program of fact-finding and voluntary co-operation such as is recommended in the report of the U. S. Coal Commission. That recommendation was conceived in the utmost friendliness for the industry. It is a necessary first step toward the prosperity of a business which is essential to the national life.

John Hays Hammond

Bituminous Mines, Facing Unusual Demands At Home and Abroad in 1926, Demonstrate Efficiency and Public Service

By Walter Barnum
President, National Coal Association

Without "overdevelopment" industry could not have fuelled nation and met world shortage of coal last year. Plant capacity and operating skill, however, were equal to that task.

THE RECORD of the bituminous industry for 1926 presents an unusual number of interesting features. The anthracite strike, four months old at the beginning of the year, continued for another month and a half before a settlement was reached and its effect upon the demand for bituminous coal was felt for several weeks longer. As a result of that demand, production for the first four months of the year amounted to 226,000,000 tons, as compared with 198,000,000 and 204,000,000 tons for the corresponding months of 1924 and 1925, respectively.

The British strike began on the first day of May. Whereas the anthracite strike had affected only the United States and Canadian markets for bituminous coal, the British strike not only brought an unprecedented demand for coal for overseas export, but affected the local markets as well. This strike was settled by district agreements, most of which were entered into before the end of November. However, Great Britain had made comparatively little progress at the end of the year toward the recovery of her foreign business. Foreign demand for American coal and American production continued at a high rate until the end of the year. Production for the four months, September to December, inclusive, was nearly 224,000,000 tons, as compared with 179,000,000 tons for the same months of 1924, and 202,000,000 tons in 1925, the latter during the anthracite strike.

578,000,000 Tons Produced

Aggregate production for the year 1926 was over 578,000,000 tons. This amount is over 9,000,000 tons in excess of the 1920 output, which constituted the previous peace-time record, and almost exactly equal to the record output of the war-year 1918. For the last four months of the year, however, the 1926 output of 224,000,000 tons was nearly 35,000,000 tons in excess of the output of the corresponding months of 1918.

The year 1926 also saw the establishment of new records for weekly and monthly production. So far as the former record is concerned, there were no fewer than seven weeks during the last three months of the year with an output in excess of the previous record of 13,344,000 tons made in the week of Oct. 25, 1919. The production for three of these weeks was in excess of 14,000,000 tons, the maximum being 14,676,000 tons for the week of Dec. 4. This amount was 1,332,000 tons, or 10 per cent above the previous maximum.

Previous to 1926 the highest monthly output recorded was in October, 1919, when 57,200,000 tons were produced in anticipation of the strike on Nov. 1 of that year. In November, 1926, the output was 59,721,000 tons. Production during the first half of December exceeded that of the first half of November, but declined during the latter part of the month on account of the Christmas and New Year holidays. The maximum output for a consecutive 30-day period was between Nov. 12 and Dec. 11, inclusive, when 61,117,000 tons were mined.

A weekly output of 14,676,000 tons is at a yearly rate of more than 765,000,000 tons, while even a 30-day rate of 61,117,000 tons, if continued throughout the year, would give an output in excess of 743,000,000 tons. This high rate of production, made solely in response to a hitherto unprecedented demand, affords striking evidence of the superficial nature of the charge of overdevelopment frequently brought against the industry, and also furnished eloquent testimony to the efficiency of the industry.

If the industry is to be prepared to serve the country and the world in time of need, overdevelopment must be measured not by the yardstick of capacity in excess of a normal yearly demand of 500,000,000 or 525,000,000 tons, but by the measure of the demand at any one time, over which the industry has no control. Hence due regard must be given to the factor of maximum requirement, which, as I have shown, is 765,000,000 tons. In the light of these figures, overdevelopment appears to be relatively slight.

16.5 per Cent Labor Cut

In this connection it should be noted that a considerable amount of labor which was attracted into the industry by high wages has gone into other industries. Between 1920 and 1923, both years of large production, the number of mine employees increased from 639,547 to 704,793. In 1924 the number employed was reduced to 619,604; in 1925 to 588,493. This is a decline in two years of 116,300 employees, or 16.5 per cent. During the same two years the average output per man employed increased from 781 to 884 tons. Similar figures for 1926 are not yet available.

Attention has frequently been called to the extent to which non-union production has increased in recent years. Geographically, in spite of the very substantial increase in non-union production in Pennsylvania, that has meant an increase in production in the East from the states south of the Ohio and Potomac rivers. In 1923, Pennsylvania, Ohio, Indiana and Illinois in the North, and Kentucky, Virginia and West Virginia in the South produced 482,404,000 tons of bituminous coal. The three Southern states contributed 34 per cent of the total. In 1924 the same seven states produced 408,413,000 tons, but the proportion of the three Southern states rose to 38.5 per cent. For 1925, the

figures were 443,346,000 tons and 43 per cent. During 1926 the unusual demand caused an increase in union production sufficient to check, but not sufficient to overcome, the Southern drift. The aggregate production of the same seven states from Jan. 1 to Dec. 18, 1926, was 479,823,000 tons, of which the three Southern states produced no less than 45.5 per cent.

British Strike Boosts Exports

The occasion for the great increase in demand for bituminous coal during the latter part of 1926 was the strike of the British mine workers. The cutting off of the British supply led to the placing of large orders in the United States by Great Britain herself as well as by some of her foreign customers. Overseas exports from Atlantic ports approximated 22,000,000 tons in 1926, while the annual average for the previous three years was 5,000,000 tons. If the estimated total of 22,000,000 tons is accurate, overseas exports for 1926 will be slightly in excess of the previous high record established in 1920. Moreover, of these excess overseas exports, amounting in round numbers to 17,000,000 net tons, only a little over 5,000,000 tons moved prior to Sept. 1. The limiting factor during the last four months of the year was neither foreign demand nor mine capacity, but the ability of railroads and piers. Without this check, aggregate exports would have reached astounding proportions.

The British strike then furnished the United States during the last four months of the year with an increased market for some 14,000,000 net tons of bituminous coal, this figure representing excess overseas exports and increase in bunker coal. Output the same months increased to a far greater extent, exceeding that of 1924 by 44,000,000 tons, and exceeding the average for the years of 1924 and 1925, in spite of the anthracite strike in the latter year, by nearly 34,000,000 tons. While increased industrial and transportation activity doubtless absorbed a part of the excess, it is unquestionable that some of it has gone into consumers' stocks.

According to the report of the Bureau of Mines, consumers' stocks on Oct. 1, 1926, amounted to 44,000,000 tons, exclusive of the 7,500,000 tons at the Head of the Lakes and an indefinite amount in transit. It is unfortunate that no close study has ever been made of the amount of coal rolling under different conditions of production. However, on the conservative estimate that ten days' loadings are on wheels at any time, there would have been an additional 20,000,000 tons on top of ground on Oct. 1, making an aggregate supply of over 70,000,000 tons.

Walter Barnum

With increased loadings the amount of coal rolling increased to around 25,000,000 tons by the middle of December. Since that time there has probably been a slight decline, although all reports indicate that there is an increasing delay in getting cars unloaded. Meantime the supply at the Head of the Lakes has declined. With due allowance for all the factors involved, we probably entered 1927 with about 80,000,000 tons above ground. If anything like the present rate of production continues, it is evident that stocks will not be reduced between the present time and the first of April; on the contrary, the probability is that they will be materially increased.

IN 1926—

Last year, the bituminous coal industry of the country:

Broke all weekly production records;

Pressed close on the 1918 annual output record;

Taxed the capacity of tidewater piers with an extraordinary flow of coal overseas during the last six months of the year;

Held average spot prices to $2.21 despite hysterical buying.

At this point I want to stress the importance of coal storage, which, in general, of course, should take place at the point of use, as this will accomplish the most in relieving transportation and safeguarding supply. Authorities on the subject have frequently recommended that the large coal consumers purchase their coal on an annual contract for yearly requirements, with the provision that the coal be delivered monthly in equal allotments. It would be a relatively simple matter for these consumers to provide necessary storage facilities to meet the terms of such contract.

It is impossible to forecast the outcome of the conference between union operators and mine workers scheduled for next month. If a deadlock with a resulting suspension of operations at union mines ensues, what inconvenience will the public suffer? I have no hesitation in saying that, at the most, it will be very slight. So far as mine capacity is concerned, non-union production alone can keep pace with consumption—at least during the summer and autumn—and no general strike in the union fields has ever continued more than five months.

Demand Recession Foreseen

What the demand for bituminous coal will be during 1927-28 can not, of course, be definitely foretold. It is altogether probable that by April 1 British mines will have recovered their normal stride and will be able to take care of their foreign customers. The preponderance of sentiment among financial forecasters seems to be to the effect that the year 1927 may see some slight recession in the high tide of business activity in the United States, though they express no fear of a general industrial slump. It seems, therefore, that the demand for bituminous coal, both domestic and foreign, may be a little less in 1927 than in 1926. If that should prove to be the case, the pressure upon non-union mines in case of a union suspension will be reduced.

Significant are the contrasts in annual output during the last five years and the seasonal fluctuations between midsummer and midwinter produc-

What of the Future?

Production during the next coal year will undoubtedly be below that of 1926-27 unless there should be a revival of unusual export demand.

While the labor situation in the union fields is clouded by the expiration of the Jacksonville agreement on March 31, capacity in non-union fields has developed so rapidly within the past eight years that the consuming public has little to fear from a suspension of operations in the Central Competitive Field and allied union districts.

The legislative situation will bear watching. Government regulation could only mean the beginning of an era of bureaucratic control of all industry.

tion, amounting to more than 50 per cent even in a year of unusual activity like the one through which we have just passed. Regularity of production from year to year can be secured only by eliminating yearly fluctuations in business activity, and regularity of production week by week throughout the year must await the willingness of consumers to distribute their year's purchases on the same basis. The industry itself can do almost nothing to reduce the extent of such fluctuations.

Loading Machines Advance

A publication by the Bureau of Mines issued during the latter part of 1926 gives us the first definite information with respect to the extent to which mechanical loading machines have been introduced in bituminous mines. While the absolute amounts so reported are not very imposing, the rapid rate of increase in recent years furnishes additional evidence of the efforts of bituminous operators, spurred on by the highly competitive condition of the industry, to lower their cost of production through improvements in mining methods. The report shows that between 1923 and 1925 the number of loading machines in use increased 172 per cent, while the amount of coal loaded by machines during the same time increased 232 per cent.

In its rapid adoption of this most recent development in coal mine equipment the industry is following its own example as set by its earlier adoption of coal cutting devices. In the use of these and of all other forms of mechanical equipment the American industry is in the van of progress and the widespread utilization of these devices is responsible for the high rate of production per man employed, which increased from an annual average of 713 tons for the five years 1919 to 1923, inclusive, to 781 tons in 1924 and 884 tons in 1925.

A review of the coal industry for 1926 would be incomplete if it did not include a reference to the renewed agitation for legislative interference with the industry which has found its expression in the introduction of numerous bills in the Congress of the United States. The immediate occasion for the renewal of the attack was the anthracite strike of 1925-26. It would be difficult to point out any failure of the bituminous industry to perform its full duty on that occasion. On the contrary it was able to render particular service to the country, increasing its output sufficiently to ward off any danger of suffering or hardship because of the shortage of anthracite. It is an interesting illustration of the irony of fate that the very record which should entitle the industry to credit is made the basis for invidious attack.

Regulatory Measures

I can do no more than refer briefly to the two measures now before Congress; the Copeland bill in the Senate and the Parker bill in the House. If minor differences are overlooked, both bills embody the same provisions; namely, compulsory fact-finding, mediation and emergency control. Extensive fact-finding on a voluntary basis is now being carried on by trade papers, by local bituminous coal associations, and by various agencies of the government. The trade information committee of the National Coal Association has charted a course which has received wide commendation, including favorable comment from Secretary of Commerce Hoover. No one has succeeded in pointing out any additional information that would be really useful as a guide which the industry is not ready to furnish on a voluntary basis. All industry, of which bituminous coal mining is a part, reports a great mass of information to the Department of Commerce and other governmental agencies and our industry naturally resents the implication involved in the proposal to select it for special compulsory treatment.

Mediation and the emergency control of distribution are already as adequately provided for through the Department of Labor and the Interstate Commerce Commission as they could possibly be by any new agencies established under the bills now before Congress. In fact, the only effect of the enactment of the proposed laws would be to substitute inexperienced for experienced agencies and diminish rather than increase administrative efficiency.

Dangerous Legislation

The bills under consideration revive certain sections of the Emergency Act of 1922. The most revolutionary and dangerous feature of the bills is found in that portion of the 1922 Act which provides for fixing of prices in times of emergency. We are familiar with attempts to prevent centralized industries from extorting monopoly profits. This is the first instance in our history in which in time of peace it has been proposed that the arbitrary power of the government should interfere with the natural adjustment of prices under freely and fully competitive market conditions. The experience of the last few months of 1926 serves to illustrate how speedily a rise in price brought about through a sudden increase in demand results in increased output, and a prompt price change in the opposite direction.

The fact is that the proposed legislation is at once unnecessary, inexpedient and hazardous. It could not be otherwise than little in accomplishment and large in danger. Once let the tentacles of the octopus of bureaucratic control fasten themselves upon this important branch of American industry and the present generation will live to see all industry swallowed up in the morass of political stagnation.

Anthracite Industry Rests Success for Future On Engineering and Merchandising

The recovery of markets, temporarily lost through strike, has not given operators a false sense of security. Producers are active in efforts to supply good product and market it more efficiently.

By S. D. Warriner
President, Lehigh Coal & Navigation Co., and Chairman, Anthracite Operators Conference

THIRTY-NINE WORKING DAYS in the anthracite industry in 1926 were lost through continuation of the strike which began Sept. 1, 1925. This strike was finally settled by an agreement reached on Feb. 12, and ratified on Feb. 16, the mines resuming after a strike of 170 days, the longest in anthracite history.

The loss in production during the seven weeks of idleness in 1926 was in the neighborhood of 10,000,000 gross tons. Work has been steady at the mines ever since resumption, and some of the lost tonnage was made up during the summer, so that on Sept. 1, the anniversary of the strike, the output for the calendar year was only about 7,000,000 tons behind the same period in 1925. This was of course more than made up in the last four months of the year, the total output being within 2,000,000 tons of that of 1924, a year of uninterrupted activity.

What Contract Provides

The contract signed last February runs to Aug. 31, 1930, and contains a proviso that after Jan. 1, 1927, but not oftener than once a year, either side may ask for a modification in the wage scale, with a board of two men to be named by the parties themselves in case the Board of Conciliation can not agree. It is believed that this contract carries with it definite promise of peace in the industry for the coming four years.

Commercial production of anthracite in 1925, with four months from Sept. 1 to Dec. 31 lost through the strike, was 50,582,990 gross tons, a decrease of more than 19,000,000 tons as compared with the preceding year. While official figures for 1926 are not available, at the time of writing, operations have been very steady and at a high rate since production was resumed and the total for the year may be estimated at approximately 76,000,000 gross tons.

Lacking official figures for 1926 little can be said on the subject of price trends, but the average mine prices in recent years arouse considerable interest. Average mine prices per ton in 1925 were more than 12c. below those of 1924.

Figures on commercial production and value for the five years ended with 1925, reported by the U. S. Bureau of Mines, are:

Average Value per Ton

	Commercial Production Gross Tons	Value at Mines	Average Value per Ton at Mines
1921	70,191,076	$437,488,640	$6.223
1922	39,768,901	255,574,915	6.426
1923	71,718,088	482,404,160	6.726
1924	69,906,363	466,720,562	6.676
1925	48,805,380	319,862,247	6.553

The above figures apply solely to fresh-mined coal, and exclude all coal taken from culm banks by washeries, all coal dredged from creeks and rivers, and all coal used for heat and power at the collieries. The average charge in 1925 for fresh-mined coal, at the mines, was therefore more than 17c. below the average of 1923, in which year the Pinchot advance of 10 per cent in wages became effective. In short, since 1923, the average mine price of fresh mined coal sold has declined more than 2.5 per cent, in addition to which the increased cost due to the 1923 wage increase has been absorbed.

Taxation Excessive

Excessive taxation of anthracite properties by county and municipal authorities continued to hold attention during the year, as it is one of the most important and vexing problems in the industry. All told, anthracite annually pays something like $18,000,000 in county, municipal and school taxes, an average of about 25c. a ton commercial production. This is exclusive of any federal or state taxes, and of the Pennsylvania tonnage tax.

So heavy is the burden that the chairman of the Pennsylvania State Tax Commission, which is drafting suggestions for tax simplification and readjustment, publicly stated that the anthracite industry was the most heavily and most unjustly taxed interest in the state, and that something should be done to "relieve coal producers from the excessive burden of taxation, which is not entirely due to state laws, but to a large extent by increasing local assessments on coal lands."

Providing Combustion Service

The Anthracite Coal Service, an agency of the Anthracite Operators Conference designed to help consumers solve combustion problems, continued and extended its activities during the year. This service, with headquarters in Philadelphia, has branches in six principal cities, between and including Boston and Washington.

In addition to demonstrating the advantages of small sizes of anthracite as industrial fuel, or domestic fuel in low pressure heating systems, competent combustion engineers are always available to advise users on the most economical sizes to buy and the best methods of burning. There is, of course, no charge for this service.

As to the future of anthracite, one may look forward with a feeling of greater confidence than was perhaps justifiable a year or more ago. Fears were expressed, and with considerable reason, that anthracite had suffered a permanent diminution of its markets. The reasons were mainly the disaffection of customers by reason of interruption of supply, and high prices due to strikes, with the resulting adoption of substitutes. In some sections which had always

been good anthracite markets we were told that many consumers would never again burn anthracite.

Today we know better. Anthracite has won back its temporarily lost markets—and, it must be assumed—on its merits. There is no other reason why the domestic consumers of New England, for example, should have resumed the burning of anthracite as soon as it became available. The amount of prepared bituminous going into this territory is now trifling compared with what was predicted. In spite of the utmost efforts of competitors, anthracite shipments to its long-held Eastern markets are, if anything, heavier than in the past. It has been demonstrated, in other words, that the consumer prefers anthracite on account of its safety, cleanliness, and other advantages as a domestic fuel.

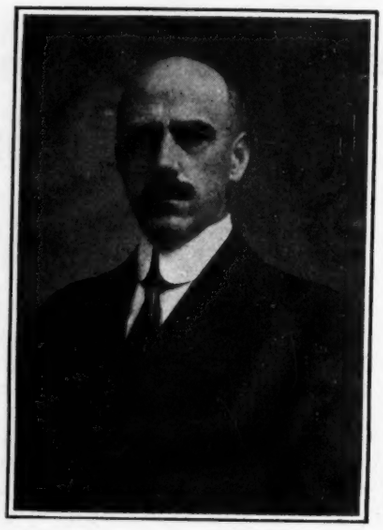
NOT DECEIVED BY MARKET

Such an outcome of an admittedly dangerous situation might have lulled anthracite producers and distributors into a condition of complacency. On the contrary—and in this is the best assurance of the future of anthracite—there never has been a time in my experience when the producers were more active in their efforts to supply a good product and to market it with increased energy. There is no disposition on the part of anyone in the industry to assume that all is plain sailing. On the contrary, there is constant effort and study to merchandise our product more efficiently.

With this end in view plans are being carried out to extend the activities of the Anthracite Coal Service. This organization has offices in Washington, Philadelphia, New York, Boston, Albany, Syracuse, and is establishing representatives elsewhere. Necessarily the major part of the time of the corps of combustion engineers connected with the service has been devoted to the large consumer. The new development in this effort is directed to extend the service through the dealer to the domestic consumer. A good start has been made in this direction, and I am confident that its results will be effective in enabling the domestic consumer to get a greater degree of satisfaction and economy out of his anthracite fuel.

STUDY OPERATING EFFICIENCY

From the operating side of the industry every effort is being made to improve the product by greater care in preparation and in handling



S. D. Warriner

throughout the line of distribution. Improved processes are being adopted wherever practicable. Generally speaking there is no disposition to be satisfied with things as they are, but constantly to strive for better performance. In this effort the industry is enlisting more and more the co-operation of the dealer. It is gratifying to be able to say that never has the latter branch of the industry shown a better disposition to adopt progressive methods and to co-operate with the producers of anthracite in ways that will better serve the consumer.

NEW FIELDS FOR BUCKWHEAT

One of the outstanding developments of the future will be, I believe, a larger use of small sizes, particularly No. 1 buckwheat for domestic purposes. This trend is not a new one, but it is becoming more marked all the time. There are hundreds, if not thousands, of dealers at the present time handling No. 1 buckwheat, who did not market this size in the past simply because there was no demand for it, except for the making of steam. The efforts of the producers to extend the use of buckwheat have been admirably backed up by the manufacturers of appliances for burning the cheaper sizes, and these manufacturers have reaped a substantial reward in the greatly increased distribution of magazine feed boilers and other appliances.

There is still a broad field for improvement in the distribution of the various sizes of anthracite. This will come through the better education of the consumer. A much more healthy situation will exist when there is a balanced demand for each of the sizes corresponding to the supply of these sizes. The excess of demand for stove coal is something for which there is no good reason. It represents very largely habit rather than the requirements of the consumer. In other words, many of those who are insisting upon and paying a premium for stove coal could with profit to themselves use other sizes.

It will obviously be a more healthy situation when the cost of production is evenly distributed over all the sizes. At present almost a third of the production is sold at a price three or four dollars below the cost of production simply because of lack of demand, and the competition of these smaller sizes with soft coal. If it is true, as we believe, that these smaller sizes have a utility and a value which bituminous coal does not possess, it should be possible to take them, to a great extent, out of the category of competitors with bituminous fuel.

ENGINEERING TO FORE

With a view to determining many unsettled questions with respect to the burning of anthraciite, the operators are conducting an elaborate series of experiments, at no small cost, to determine which sizes and combinations of sizes are most efficient for a given purpose, and in various types of household appliances. These experiments will cover a long period of time, and while immediately results from them are not perhaps to be expected, the progress reports which we receive from time to time are already of value in determining the efficiency of various sizes of anthracite under given conditions. These experiments will be continued until we are able to say with definiteness, and on the basis of scientific data, what are the practices that will give the consumer the highest degree of economy in the use of anthracite. These results also will enable us to carry forward the effort in connection with which a beginning was made by the standards adopted in 1925.

We are, it seems to me, justified in assuming that the industry has a considerable period of peace ahead of it. This applies as well to the legislative as to the labor situation. In this period the industry will endeavor to work out its problems, set its house in order so far as may be necessary, with results that cannot fail, in my opinion, to increase its usefulness to the public.

How a Banker Looks Upon Coal Investments

By Robert K. Cassatt
Cassatt & Company, Philadelphia, Pa.

Average producer lacks full knowledge of financing bituminous coal properties. Banker carefully considers several factors in arriving at decision to accept or reject an issue of securities.

ALTHOUGH it might appear that those engaged in the bituminous coal industry have had ample opportunity to learn the attitude of the investment banker and of the investing public toward their industry, I think it may be permissible to risk a certain degree of repetition because the experience of most bankers teaches them that the desirable relationships between coal producer, banker and the public are but imperfectly understood by the average producer who seeks the help of the banker in obtaining funds for his purposes from the public.

It may, therefore, be helpful if we restate what factors are considered by the banker, what are his mental processes in arriving at the decision to accept or reject a proposal placed before him to buy and offer to the public an issue of securities based on the operation of one or more bituminous mines. If I am at all successful in this effort, it may result in putting before the operator some of the essentials without which his effort to obtain money from the public is doomed in advance to failure.

A New Experience

Most coal companies in this country are the result of individual effort and individual investment by those directly concerned with the operations themselves, and their expansion has been financed, and properly so, by ploughing back earnings. There are, of course, many instances where local financing has been done through banks or otherwise, and in many cases companies have outgrown this stage and their securities have reached the general public. It is with such cases that I propose to deal, that is to say, where the company desires to obtain funds from that portion of the public which is totally unacquainted with the industry and is only desirous of obtaining, with the help and advice of the banker, a sound investment. That is the kind of public I shall refer to in this article, and for that very reason it is apparent that the responsibility of passing on the proposed security rests on the investment banker and on him alone. The public accepts or rejects the security almost wholly on the reputation of the banker who presents it to him.

How, therefore, should the bank meet this responsibility? Obviously he must have sufficient knowledge of the industry to qualify him to pass on the security for his clients, and he must use that knowledge in the first place to guard his clients' interests and at the same time to create such a capital structure for the company as will permit it to operate successfully.

No Rule-of-Thumb Methods

I do not propose to repeat any rule-of-thumb methods of gauging a coal security but rather to touch on certain generalities which experience teaches me are imperfectly appreciated.

In general, then, when a company first goes to the public for funds it must do so with a full realization that by doing so it invites a partnership which goes beyond the mere agreement, and fulfillment of that agreement, to pay a stated return for the use of those funds at stated periods and the final return of the principal. The public, I believe, feels that the partnership is wider, that it is entitled to full information on many of the details of operation, policy and management, costs and profits which have been considered in the past not matters of public concern.

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Robert K. Cassatt

Publicity Essential

Inasmuch as the securities presumably are such that they may be freely traded in over the counter or through the stock exchanges any man in the street may at any time become a partner so that, in effect, the obligation to take the partners into the confidence of the management becomes practically an obligation to take the public as a whole into confidence. Prof. Ripley's recent articles illustrate this trend in public thinking. I emphasize it here because I sometimes believe that many coal men who would like to draw upon the public for funds do not appreciate the commitments they are entering into and also because this frank and open dealing with the public at large may prove an effective barrier to further demands for government control.

A great many of the troubles that arise between coal operators and bankers arise because the operator has not realized these obligations.

Having made this clear to the prospective borrower, the banker will give due consideration to these matters:

Management: Under this head the banker will consider the ability, experience, reputation, activity and "punch" of the prospective managers with the greatest care, because it is realized that to operate a coal property successfully, to care for its financial problems and to provide for disposing of its product, requires a high degree of business sagacity plus strict attention to the affairs of the company and unflagging energy. No coal property will run itself and there is no type of activity which can more quickly be ruined by bad management. Included under this head are engineering skill, ability to handle labor, selling ability and the faculty of getting on with competitors.

The management of coal properties

does not average high, I am sorry to say. Often one or more of the departments are well handled, but rarely all. It behooves the banker, therefore, to be satisfied as to this feature before even considering other factors.

How Much Reserve Tonnage?

Acreage and Quality of Coal: Briefly stated, the banker's concern as to these matters will lead him to assure himself of sufficient (but not burdensome) reserves containing coal of a quality that will sell in competition with coals which reach the same markets. With the present excess of production, it is courting disaster for the banker to finance, or the public to invest in, coal properties containing mediocre or inferior grades of coal. Such coal should be left in the ground for future generations to use after our better coals are exhausted or command excessive prices for special purposes.

Markets: This head should be studied by the banker to determine whether the consuming market is sufficiently broad to take the available coal pressing for sale. It would be easy to cite the existence of excellently developed coal properties containing high grade coal, which properties have no immediate chance of success because of lack of market.

Engineering Skill and Policy: In these days of rapid improvements in mechanical operation of coal mines, it is wise to determine whether the engineering force is alive to such possible savings and whether the financial structure provides for the large expenditures necessary to install the most modern labor-saving devices. In my opinion, if there is one thing sure about the future of the bituminous industry, it is that only those companies will prosper or even survive, who take full advantage of modern mechanical methods.

Merchandizing Policies: These must be capable of following sound lines as in other industries, such as good service to consumers, insistance on proper preparation of coal, proper study of statistical matters and, above all, a strict adherence to contract obligations.

What of Past Earnings?

Past Earnings and Future Prospects: The banker will require to know that the past earnings are amply sufficient to protect the securities he proposes to issue and that these earnings have been made under conditions likely to continue, and not through any fortunate set of circumstances. There are those who prefer to judge a company by estimating what it will do in the future rather than on its past record, and to a certain extent this view is sound. But, on the other hand, the public is accustomed to estimating the future from past data, and it would take a long campaign of education to change this attitude, even if it were wise to discard the factor of past records. The banker is, therefore, bound to see that the past earning record is satisfactory.

All the above factors will in the aggregate determine his action, and the greatest of these is perhaps management.

Assuming that the banker closes the deal, he will insist on an effective method, not controlled by the operator, for obtaining at all times full information as to the operation of the properties. The most effective way to accomplish this is to give the banker representation on the board of directors, not, with the idea of permitting him to interfere with the management of the property, but to give him a legal right to such information as he may desire, thus placing him in a position to advise his clients of the condition of the company, and to advise the company on its financial problems when they become involved or serious.

I have purposely avoided the labor question and shall not now discuss it, but the banker cannot fail to take into his calculations the probability of a favorable labor situation or the reverse.

New Mines Discouraged

For what purposes should a banker in these times consider underwriting coal issues? I shall begin by answering in the negative. He should not furnish money to create new production at a time, such as this, when potential production is far in excess of demand. And he should not furnish funds to buy out existing owners, whether singly or in the process of the formation of mergers. Mergers, if they are to interest the public, must not be on a sell-out basis, but real mergers as the name implies.

The banker may, I think, properly finance additional working capital either to protect existing worthy properties, or to strengthen proposed mergers. He may furnish funds to transform an operation from one of man-power to one of machine-power, or for any other purpose which will reduce production costs of an existing operation. In any case the banker will see that funds obtained from the public are properly applied, and not diverted to objects foreign to their original destination, such, for instance, as the acquisition of additional and perhaps surplus reserve acreage.

If the general conditions which I have tried to outline can be met by the company seeking funds, I believe that capital is available on terms which will be governed by all the surrounding conditions and by the general trend of the money market; but, broadly speaking, the cost of money to the bituminous industry will be relatively high until that industry has eliminated most of the glaring weaknesses which have characterized its collective management in the past.

MODERNIZATION, MANAGEMENT— AND THE BANKER

When the question of financing a coal property comes up, the banker is going to consider carefully management, acreage and quality, market possibilities, engineering skill and the attitude of the management toward the proper employment of engineering talent, past earnings and future prospects. "And the greatest of these is management."

The banker is not interested in mergers which do not fill an economic need. The old idea of a "sell-out" basis is viewed with a gelid eye.

The banker is not living in the past, but is facing tomorrow. For that reason he is convinced that the only coal mining company which can hope to survive is the one that takes full advantage of the advances in mechanization. Archaic systems may have a museum appeal, but they will not go far in interesting the financial house which underwrites industrial securities.

Coal-Mine Fatalities in 1926 Indicate Slight Increase Over Preceding Year

By Scott Turner
Director, U. S. Bureau of Mines

THE U. S. Bureau of Mines was established by Congressional act in 1910 largely for the purpose of preventing accidents in coal mines. Since that time, the work of the Bureau has branched out in many directions, but since sec. 3 of the organic act states that "said bureau shall prepare and publish . . . reports of inquiries and investigations, with appropriate recommendations of the Bureau, concerning the nature, causes, and prevention of accidents," mine-accident statistical work has has always been carried on by the Bureau.

This work is now being done under W. W. Adams, Supervising Engineer of the Mine Accident Statistics Section of the Mineral Resources and Statistics Division of the Economics Branch of the Bureau. Facts and figures embodied in this article were collected and prepared by this section.

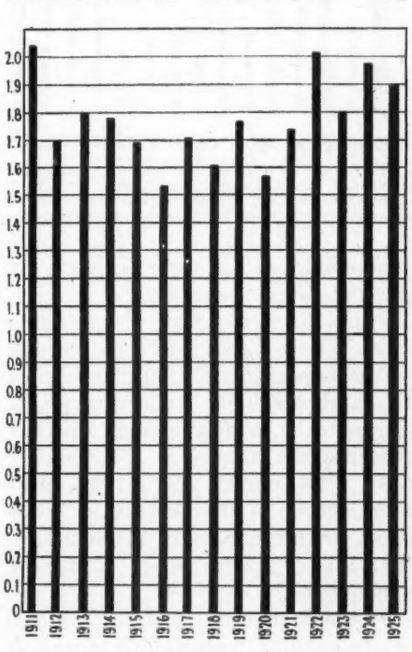
Rise in fatality rate occurred in bituminous mines. Anthracite death rate lower than in 1925. Increase in use of rock dust in year just ended not considered as rapid as it should have been.

Fatality Rate Up

During 1926 a series of coal-mine explosions considerably increased the explosion-death rate over that for 1925. However, judging from information available at this time, these will only slightly increase the net rate for all classes of accidents combined. Sixteen major explosions* in 1926 resulted in the loss of 342 lives, as compared with fourteen similar disasters in 1925 causing 270 deaths. Reports actually received to date show a small reduction from last year's fatality rate, but it is expected that the rate for 1926 will rise slightly above the rate for 1925, when revised reports, covering deaths from serious accidents that did not prove immediately fatal, are finally received from state mine inspectors. The rise in the coal-mine fatality rate in 1926 was exclusively in the bituminous-mine group; the anthracite rate was lower than in the preceding year.

This 1926 record, unfortunate as it was, may serve to increase the effort to make 1927 register a reduction in the accident-cost of coal. Such an improvement might be largely brought about by the rock-dusting of coal mines. It has been demonstrated that rock-dust, if thoroughly applied, and maintained in all open workings at a minimum of 65 per cent incombustible material, is an effectual measure against major explosions of coal-dust. It therefore follows that destruction of property and life from this class of mine accidents is largely a preventable waste and a needless charge upon production. Moreover, it is estimated that the cost of preventing major explosions of coal-dust is less than the losses that result from the failure to apply this means of prevention.

The prevention of major coal-dust explosions is a relatively simple matter, because methods of prevention are mainly engineering problems and these engineering problems have to a large extent been solved. Also, the care or carelessness of the individual employees is less important in the prevention of mine-explosions than in the prevention of other classes of accidents, such, for instance, as falls of roof. If discipline, and safety-rules are enforced, the whole problem of preventing major explosions is capable of comparatively simple solution, but vigilance on the part of the company is required in preventing open lamps, matches, improperly designed electrical equipment, explosives other than of a permissible nature, or other sources of ignition from being taken into the mines.



Coal-Mine Accidents of All Kinds in United States

The calculation is based on million man-hours of employment, underground and on the surface. The figures for 1925 are less favorable than, and the figures in 1922 almost identical with, those of 1911.

Safety Engineering Needs

As to the engineering features, they include the use of closed lights, the use of rock-dust to dilute the coal-dust sufficiently to form a non-explosive mixture; adequate ventilation to prevent accumulation of explosive gases in dangerous quantities; the use of "permissible" explosives for blasting coal; and the use of "permissible" electric equipment for cutting, loading, and hauling coal. The safety precautions just described serve the double purpose of, on one hand, eliminating the hazard of gas and dust, which are the substances on which explosions feed, and, on the other hand, eliminating the usual causes of ignition of gas or dust.

The cost of rock-dusting is reported to vary from .5 to 2c. per ton of coal produced. Of the 342 lives lost during the past year from major explosions, 321 were lost as a result of explosions involving coal-dust. Figuring each fatal accident as the destroyer of 6,000 man-days of productive labor, in accordance with the standard adopted by the

*A major explosion is one in which five or more men are killed.

Association of Industrial Accident Boards and Commissions, the coal-dust explosions in bituminous mines, in the past year, represent the loss of nearly 2,000,000 man-days. Part of this loss is paid for directly by the mining industry in the form of loss of production of coal, expenses incident to mine-recovery and repair, and in compensation paid to dependents of the deceased miners; but perhaps the larger portion is an indirect loss to coal consumers and to industry in general. To the extent that the mining industry can reduce this waste, it is obviously the industry's obligation to do so.

SPEED UP ROCK-DUSTING

Only about one-fifth of the country's annual output of bituminous coal now comes from rock-dusted mines. While this proportion indicates progress during the past year, it does not indicate as rapid progress as should be made, in view of the number of explosions involving dust that occurred in 1926. More rapid extension of the use of rock-dust offers the greatest promise of a reduction in the loss of life from explosions in bituminous coal mines. For this reason it is hoped that mining companies will give serious attention to rock-dusting.

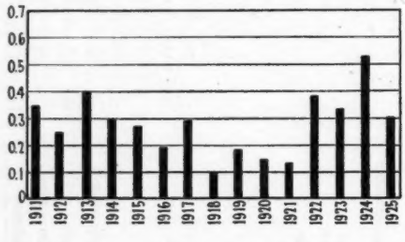
While explosions of gas and coal-dust are not the chief cause of accidental deaths in coal mines, they do comprise a class of accidents that is more amenable to preventive measures than other types of mine accidents. For that reason, among others, the Bureau of Mines has devoted considerable attention to studies looking toward the prevention of mine explosions. However, the chief cause of fatal accidents in coal mines, not only in the United States but in practically all coal-producing countries, is falls of roof or coal. These accidents, which account for nearly half of all fatalities in coal mines, are unlike explosions in that

Major Disastors in Coal Mines in the United States in 1926

Date	Location of Mine	Men Killed
Jan. 13	Wilburton, Okla.	91
Jan. 14	Farmington, W. Va.	19
Jan. 29	West Frankfort, Ill.	5
Jan. 29	Helena, Ala.	27
Feb. 3	Horning, Pa.	21
Feb. 16	Nelson Creek, Ky.	8
March 8	Eccles, W. Va.	19
May 6	Port Carbon, Pa.	5
July 3	Kingston, Pa.	7
July 21	Moffat, Ala.	9
Aug. 26	Clymer, Pa.	44
Sept. 3	Tahona, Okla.	16
Oct. 4	Rockwood, Tenn.	27
Oct. 30	Nanticoke, Pa.	9
Nov. 15	Moundsville, W. Va.	5
Dec. 9	Princeton, Ind.	30
	Total	342

Scott Turner

they seldom kill many men at one time. Usually, each accident of this kind causes the death of a single man, or a few men. Perhaps 85 per cent of all falls occur at or near the working face, where the coal is being mined. The usual victims in this class of accidents are miners, loaders and other men who work at the face. About 4 per cent of the victims are haulage employees, and about 8 per cent are maintenance



Explosions of Gas and Coal Dust

Also based on million man-hours of employment underground. No favorable trend is observable. If rock dusting were made general, the figures surely would be reduced.

men employed in various parts of the underground workings.

Thus the prevention of accidents from falls of roof and coal, which means approximately 50 per cent of all fatal accidents underground, is shown to be largely a question that concerns the miners at the working face. We should not forget, however, the falls that occur on roadways, or in other parts of the mines, that kill or injure other classes of employees.

If the death-rate in American coal mines is to be materially reduced, it will be necessary to reduce accidents from falls of roof and coal; realizing this, during the past year the Bureau of Mines assigned one of its experienced engineers to devote his full time to a study of this subject. James W. Paul, for a number of years chief coal mining engineer of the Bureau, has for several months past been engaged in the study of ways and means of attacking this problem. The co-operation of representative men in the industry is requested.

SAFETY EDUCATION REQUIRED

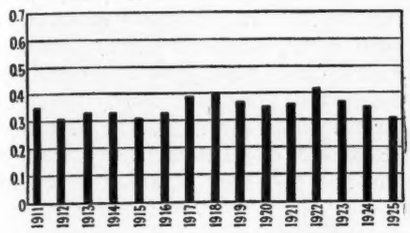
The Bureau appreciates the difficulty of the problem and believes that the matter is largely one requiring safety-education of miners and their foremen and employers. In other words, the question is not only one that calls for the discovery of additional physical means for preventing these accidents, but also and chiefly one that will require the close co-operation of the 446,000 miners and other face workers with the management of the 7,000 or more coal mines in the United States, and with other agencies interested in mine-safety, in order to reach the human element that is without doubt the largest factor among the causes of accidents from falls of roof and coal.

Fatal accidents from falls in 1926, during the ten months ending Oct. 31, show a slight reduction in the death-rate per million tons as compared with the corresponding months of the previous year. Unless returns for November and December should alter the situation, the record for 1926 should show a reduction of about 4 per cent in the death-rate from this class of accidents. Though this percentage appears small, it will, if sustained by final reports for the year, represent a material saving in life, because, as before stated, falls of roof and coal cause nearly half of the yearly total of mine-fatalities; this class of accident kills annually, in American coal mines, approximately 1,200 men.

STUDY ROOF FALLS

The Bureau is looking forward to 1927 with the expectation that more definite information concerning the underlying causes of falls of roof and coal may be revealed as a result of the study of the subject. Whatever steps are found likely to promote safety will be made known promptly to the industry, in the hope that this, the most fruitful cause of mine-accidents, may be made less destructive to life.

Underground - haulage accidents rank next to falls of roof and coal, as



Haulage Accidents Underground

The number of deaths per million man-hours of employment has not changed materially with all the changes in transportation methods.

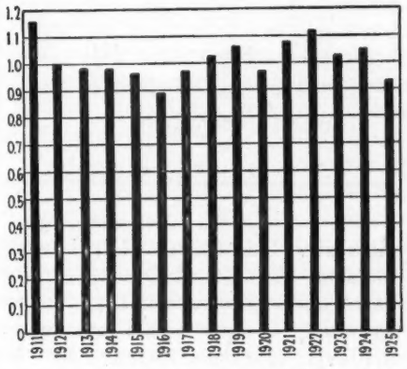
a major cause of deaths and injuries in coal mines. About one-fifth of all fatalities, and nearly one-third of the loss of time resulting from non-fatal injuries, are due to accidents that occur in connection with underground-haulage equipment. Statistics also show that more than half of all haulage-accidents underground occur in entries and slopes, and only a slightly smaller proportion in rooms. Haulage-accidents result in injuries to haulage-workers and to miners and other face-employees in the ratio of about 5 to 4, and such accidents, to these two classes of workers combined, comprise about 90 per cent of all haulage-accidents underground. Thus, accidents connected with haulage-equipment form a type of hazard that concerns every man who works underground.

HUMAN FACTOR IMPORTANT

As the human factor enters so largely into the problem of preventing these accidents, it is obvious that all classes of employees underground must be dealt with before haulage hazards in coal mines can be successfully combatted. Present records indicate that the year 1926 will not show any improvement over 1925 in the death rate from haulage-accidents in coal mines. In fact, it is probable that the rate will be found to have increased slightly.

Moreover, the experience of the United States as a whole, and that of several of the larger coal-producing states in particular, indicates that fatalities from haulage-accidents have been increasing during recent years. Any reduction, therefore, in the death-rate in 1927 will depend in a large measure on the amount of special attention which the industry gives to this type of hazard during the coming year. It seems probable that the substitution of underground mechanical loading and conveying devices, instead of hand-loading and use of cars and similar equipment at faces, should in the long run aid materially in decreasing accidents due to haulage.

While electricity and explosives do not rank among the chief causes of accidents in mines, except occasionally when they ignite gas or coal-dust and thus result in a widespread explosion, it is nevertheless gratifying to state that neither of these mine-hazards showed a high fatality rate in 1926. In fact, the fatality-rate for explosives was considerably below what it was in 1925, and the rate for electricity was only slightly above the previous year's rate. On the other hand, explosives and electricity are among the chief agencies in accomplishing the large production per man, in American coal mines, and considered as agencies that promote efficiency, their use should be encouraged. At the same time, constant study and watchfulness is required to prevent these agents of efficiency from becoming sources of new or greater hazards in the mines.



Falls of Roof and Coal

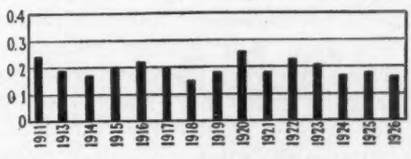
Per million man-hours of underground operation. Here again trends are difficult to establish. The rate fell from 1911 till 1916, and then rose for three years. Since then it has been irregular.

It should also be borne in mind that the initiation of many of our large coal-mine explosions and fires is due to explosives and electricity, and it is probable that if this type of accidents were added to those usually charged against explosives and electricity, the annual fatality list as to each would be practically doubled. During the past year the Bureau of Mines prepared and will shortly issue a bulletin on "Safety Rules for Installing Electrical Equipment in Coal Mines." These rules were sponsored by the Bureau of Mines and the American Mining Congress and have been adopted as standard by the Associated Engineering Societies. It is the Bureau's hope that the standards set forth in the bulletin will be widely adopted by mining companies and that safety and efficiency will thereby be promoted.

During the past year, the Bureau of Mines participated in several phases of safety work in an endeavor to contribute toward a reduction in the annual loss of life in coal mines. On Sept. 2-4, 1926, a national first-aid and mine-rescue meet was held at San Francisco, California. Competing in San Francisco were first-aid and rescue teams representing forty-six coal mining, metal mining and oil companies in thirteen states. Proficiency in first-aid and mine-rescue methods was demonstrated by contests among the different teams, and prizes were awarded to the winning teams. These demonstrations are valuable, not only in increasing interest and efficiency in methods of relieving the sufferings of persons injured in mine accidents and hastening their recovery, but also they have a decided value in accident prevention, by spreading safety education among the mining population. During the fiscal year ended June 30, 1926, more than 24,000 men were trained in first-aid or mine-rescue methods by the staff of the Bureau of Mines. More than 167,000 miners have been thus trained since the beginning of the Bureau work, about fifteen years ago.

STARTS 100 PER CENT TRAINING

In 1926, a new development in the Bureau's training work was systematic effort to train 100 per cent of the employees at selected mines whose management agreed to cooperate with the Bureau. The usual procedure involves the organization, by the Bureau of Mines, of classes of instructors chosen from the company employees; then to each instructor is assigned a small group of employees, to receive regular instruction until the course is completed. The course consists of five lessons, and Bureau certificates are issued to those who show satisfactory proficiency. Much preliminary work is required before a proper foundation can be laid to undertake to train all of the employees of any given mine



Explosives and Electricity

Exclusive of deaths from gas and coal-dust explosions initiated by explosives or electricity and based on million man-hours of underground employment.

and to insure the success of the undertaking. This 100 per cent training feature of the Bureau's work began late in 1926, as a result of plans made many months before; therefore, only a few companies have thus far received 100-per cent training, but it is hoped to extend the work as rapidly as the desire of the companies and the facilities of the Bureau will permit.

EMPHASIZE EDUCATION

As the larger proportion of accidents, not only in mining but in other industries as well, is due more to human than to physical causes, it follows that success in accident-prevention work is dependent mainly upon educational methods and on appeal to personal interest. During 1926, as also in 1925, the Bureau of Mines conducted a safety contest among employees of a number of mining and quarrying companies; the object was to establish the lowest accident rate or, rather, the smallest loss of time from accidents in proportion to total number of man-hours of work done.

This contest is known as the National Safety Competition. The mine or quarry establishing the best safety record, as indicated by its accident rate, is awarded a bronze trophy, "Sentinels of Safety." The contestants are grouped into five classes, and a trophy is awarded for the best safety-record in each group. The five groups are: 1, anthracite mines; 2, bituminous coal mines; 3, metal mines; 4, non-metallic mineral mines; 5, quarries and open-pit mines. The winning companies hold the trophies for one year and then surrender them to the winners of the succeeding year's contest.

COURSE IN ADVANCED SAFETY

Another feature of the Bureau's safety work during the past year was its "advanced safety-instruction" work. This work is conducted in connection with and as part of the safety-extension service work of the Bureau. This consists in giving instruction in mine-rescue and fire-fighting methods to fire-bosses, assistant superintendents, superintendents, managers, and general managers. Those receiving the instruction are taught what they should do in the way of controlling ventilation immediately after a disaster; what they should do in the way of erecting barricades; also how to determine the quantities of gas in the mine-air. The course of instruction includes methods of detecting mine-gases and oxygen-deficiency, the care and use of mine-rescue apparatus; methods of resuscitation; the care and use of approved electric lamps; methods of procedure for recovery operations; and surface organization for handling mine explosions and fires.

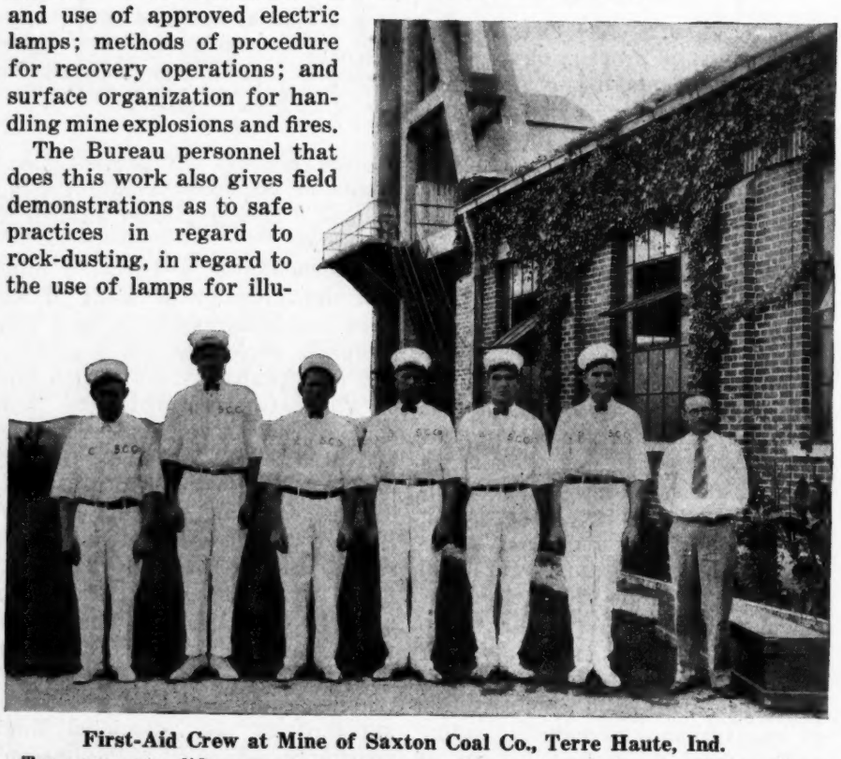
The Bureau personnel that does this work also gives field demonstrations as to safe practices in regard to rock-dusting, in regard to the use of lamps for illumination—portable electric lamps and the use of the flame safety lamp. Bureau men confer with state officials and state associations regarding safety measures, and finally they organize local safety chapters, called Holmes Safety Chapters in honor of the first director of the Bureau of Mines; they give service-aid to safety organizations that already exist; they organize the local safety chapters, and these local chapters are supposed to instruct the men who work at the face underground as to safe methods. In this work, the Bureau is cooperating with the States, mining associations and the mine operators, who give the information to their men. The Bureau also assists in outlining the program.

SAFETY LEADERSHIP

The Bureau of Mines is anxious to be of maximum service to the mining industry. It desires to render the sort of aid which the industry wants. It is particularly anxious to contribute toward a reduction in the annual losses that result from accidents to men and to property. The mining industry is invited to call upon the Bureau for assistance in the study of mining problems that are of national or widespread interest and importance. Such assistance will be rendered to the limit of the Bureau's resources.

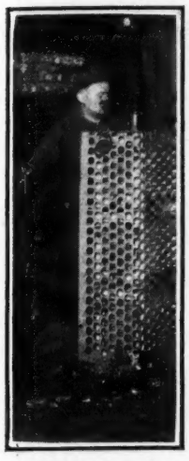
International Research

During 1926, Dr. H. F. Coward of the British Safety in Mines Research Board made investigations at the U. S. Bureau of Mines Station, Pittsburgh, Pa., into the inflammability of methane diluted with various gases, the ignition of gas by small flames, the pressures developed by gas explosions and the propagation of flame. Meanwhile Dr. R. Thiessen of the U. S. Bureau of Mines assisted the British Board in its investigations into the spontaneous combustion of coal and the flammability of coal dust.



First-Aid Crew at Mine of Saxton Coal Co., Terre Haute, Ind.

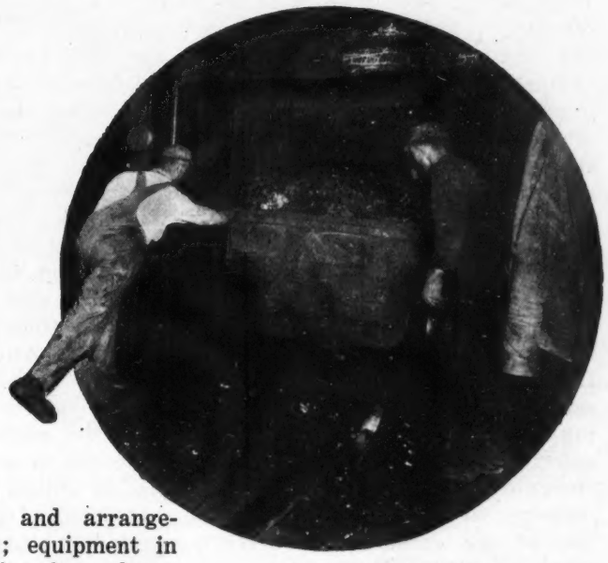
Ten years ago, did anyone see such a neat bunch of coal miners? Old traditions will all be lost when the miner leaves the shovel for the lever, as he has already left the pick for the switch on his kerfcutter and the mule whip for the controller handle on his locomotive. The loss of these traditions nobody will regret.



One man dumps 5,000 tons daily in 1926

Tradition Discarded to Make Possible New Era in Coal-Mine Engineering

By John A. Garcia
Consulting Mining Engineer
Chicago



Two men cage 1,000 tons daily in 1916

ALL OVER the country in the last few years noticeable improvements have been made in the operating methods at bituminous coal mines. Although necessity has been the mother of the coal man's ingenuity or awakening, his progress would have been impossible had he not so wisely turned from the paths of tradition and custom into the broad highway whereon other industries have traveled and are traveling so happily with science and engineering as guides.

A fertile field of scientific effort lies in coal-mine management, as the results obtained in the last few years at mines where the engineer has been permitted to co-operate with the so-called "practical mining man" has abundantly shown. The major items wherein improvement may be seen are as follows:

Underground distinct progress has been made in: Mechanical loading; rock-dusting, ventilation and other safety measures; haulage and traffic regulations; permanent structures such as overcasts, stoppings, cage rooms, etc.; extraction and concentration, as in so-called "longwall" faces; handling water at working face, along roads and at bottom; lighting at partings, cage room and along roads, individual lights; cutting, shearing and shooting; surveys, sights and projection of workings; caging and hoisting.

Surface Improvements Many

On the surface the industry has moved forward in: Sizing and preparation of larger sizes of coal; cleaning smaller sizes by both wet and dry processes; hoisting and power supply; facilities for handling railroad cars to and from tipple; washroom facilities and arrangement for sanitation; equipment in blacksmith and machine shops; housing or transporting employees; timbering and treatment of timber with preservatives.

In the office the past year has developed improved methods of cost accounting and keeping records; facilities for making maps, drawings and filing engineering data; methods of speeding up on pay days; lines of communication such as telephone, telegraph and mail.

In the field of personnel and co-operation in organization we find a better class of men in underground management; higher qualifications for certificates of mine managers, examiners, etc.; increased interest shown by state inspectors and in safety, and a greater appreciation of the importance of the engineer in mine management.

Rapid Progress in Loading

In mechanical loading of coal there has been such rapid and radical improvement that volumes could be written on this subject. There are two broad divisions to mechanical loading, first, the individual machine for loading directly into pit cars and, second, the conveyor either on longwall faces or in rooms and the placing of the coal on the conveyor either by manual effort or by machine.

The development of both the individual machine and the conveyor has been phenomenal—especially in the last year—but it must be admitted that progress has been greatly retarded in the union fields where the need of mechanization is aggravated by the Jacksonville scale because of the refusal of the union, to put it mildly, to co-operate with the engineers and management in their efforts to load coal by machinery. However, in spite of this opposition, much improvement may be noticed in the design and detail of all the machines introduced in the coal fields in the last few years. The mechanical imperfections developed in actual practice are being corrected at a rapid rate.

Must Sell Workers

The machine itself, is, of course, important in the scheme of things, but unless the operating personnel is "sold" on the idea, success is quite improbable. The education of the entire organization at the mine in the fundamentals and principles of mechanization is as necessary as is the machine's adaptability to conditions. These two requirements must be met before real progress may be expected. It is encouraging to note the attitude of the men in charge of mines towards this question. One seldom meets a mine manager nowadays who does not feel that, given the right machine, he can operate his mine on a machine-loading basis. This is a step—a long step—toward the mechanization of coal mines, for once the men in charge of the production are convinced of the practicability of a proposition, the rest may be safely left to psychology and to the engineers who have promptly and con-

fidently taken advantage of this new type of equipment in the last few years.

As regards rock-dusting, one state, Utah, has in recent years made it compulsory for the operator to practice this proven and simple method of eliminating mine explosions. Many operations all over the country are now rock-dusted, whereas two or three years ago it was seldom a mine could be found where any real effort was being made to rock-dust. It is now possible to purchase standard machinery from the manufacturer for spreading or grinding the shale, and prepared dust or proper composition may be purchased from manufacturers, as required. In other words, rock-dusting and the furnishing of the material and equipment entering into the work is now a recognized branch of the coal-mining industry, which fact alone is indicative of the great strides recently made in the promotion of mine safety.

SAFETY WORK WATCHED

Ventilation has improved in the mining fields to such an extent that it is the exception rather than the rule to find, as heretofore, either the volume or velocity of the air current below legal requirements. Quite often the management of the more modern mines considers the lawful quantity as only the minimum or as a basic demand from which to build up the quantities required for maximum safety. It probably would be impossible to find a mine where any fundamentals of modern methods are practiced, that now operates with a Guibal or paddle fan. In the last few years that type has become practically taboo at any new installation.

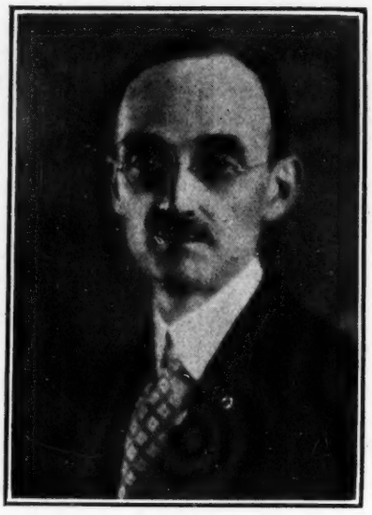
Safety and protection of life and limb are today demanded both by management and by men. Not so long ago the operator alone urged it. Any violation of safety rules is recognized everywhere as justification for immediate discharge.

In the haulage and transportation of product, coal-mining methods are far superior to those of any other branch of mining. In fact, traffic in some of the latest and most modern American collieries is handled as well as in the New York subways even though the latter are, perhaps, the more easy to operate when all the conditions are considered. In 1925-6 the mule was eliminated from all new mines. Only cable or storage-battery locomotives are now used for gathering. In the older mines the locomotive is gradually replacing animal haulage, though it is undoubtedly true in certain kinds of workings that the mule can still gather coal at less cost than the locomotive.

It is not unusual today to find the flow of traffic regulated by a dispatcher in trips duly scheduled. Such accessories as 60-lb., ballasted and graded track, solid-end cars, automatic switches and couplings, signal lights, roller-bearing wheels, etc., with continuous locomotive movement are the rule rather than the exception.

SOLID CONSTRUCTION FAVORED

Overcasts and main-line stoppings are now built either of concrete, tile or brick and seldom of the boards that were commonly used in the older mines. In panels or other short-lived entries or where some special conditions exist, wood construction is permissible for stoppings, but on main lines such construction is generally used only for temporary purposes—if at all.



John A. Garcia

In cage rooms or mine bottoms, because of deterioration and fire risk, it is now considered uneconomical to use any wood or other material that must eventually be replaced. The cage room naturally lasts the entire life of the mine and even in states where the statutes do not compel fireproof construction, practically all new mines are constructed in accordance with economic rather than state laws. Pumprooms, charging stations, repair shops, transformer stations and all underground places for housing machinery are now built of concrete, steel, brick or some other fire-resistant material.

LAGS IN EXTRACTION

Extraction seems to be a question of locality. In the Eastern, Southern and Western fields of the United States it is the common and accepted practice to draw the pillars between rooms and the entry barriers. In Ohio, Indiana, Illinois and Kansas little pillar coal is recovered. Probably this is due to the wage scale and union restrictions, to the surface values or both and possibly to habit or tradition, but from whatever cause, the percentage of extraction has not increased in the Middle Western field, excepting in those mines where longwall faces have been developed, and there are but few of these.

However, the long face has so many advantages and room-and-pillar mining without pillar drawing is so objectionable that the former is bound to gain in favor and eventually

Drilling Shotholes by Machinery in 1926

Difficult and tedious work is drilling by the aid of post and auger, especially in hard coal or where there are sulphur modules in the line of the drillhole. Air and electricity ease and speed the work considerably. A machine may have no brains but it has a strong back which is what is needed for drilling.

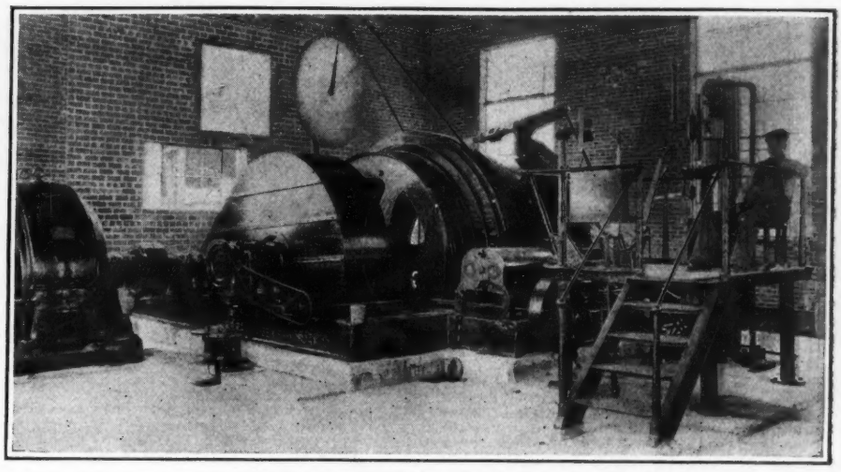
will become standard when, and if, we solve the problem of roof control upon which many very able mining men have concentrated their attention during the last two years. Study and experimental work give promise even today of the elimination of the old-fashioned room-and-pillar method. The answer to the problem of more complete extraction appears to be rapid and continuous development of the working face with concentration of operation as the primary requisite.

Pumping Practice Bettered

In handling water at the working face, a recent development in the pumpmakers' art may serve to illustrate the progress along these lines. Bailing water from working places that do not make enough water to warrant the cost of a suction line always has been a source of petty annoyance and often of much expense to the management as well as lost time to the miner, but some bright genius has now solved this problem by designing a small self-contained pump and motor attached to the water car which handles the water in one-tenth of the time, and both equipment and operating cost are so low that hand bailing cannot compete.

Pipe lines, pumps, sumps and all drainage facilities at up-to-date mines are now regarded as necessary evils and are installed as though they really belong in the general plan instead of being tolerated and built for temporary service.

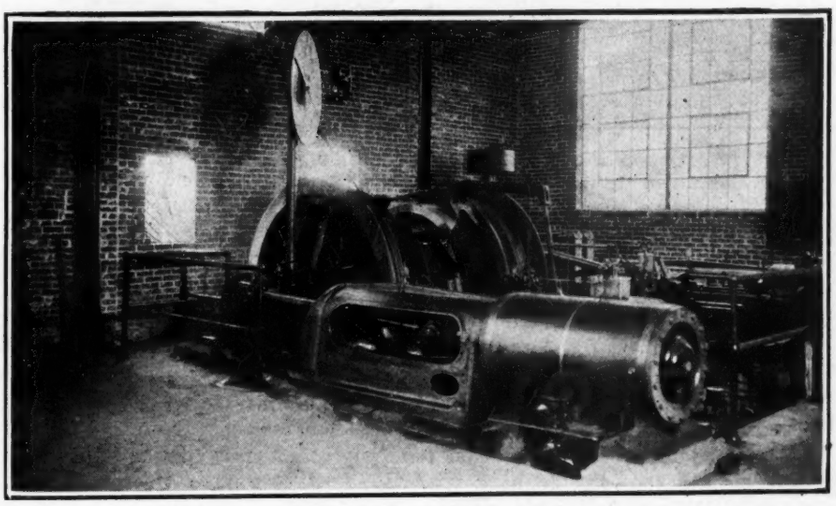
As to lights at the mine bottom, it would be a shock to any mining man to land on the bottom today at any mine and to find it illuminated only by the fitful gleam of a torch hanging on a shaft post. Yet this was the only means of illumination not many years ago. Though no laws compel the operator to use electric lights on the bottom, it is the exceptional mine today that is not equipped with enough bulbs to enable the cagers and spraggers to work without cap lamps and any well-managed mine will have ample illumination at all partings, main road crossings, pump rooms, etc. This improvement was brought about not only for its value as a safety provision, but as a means of obtaining better and faster service from employees. It undoubtedly pays big dividends on the small installation and maintenance charge.



Geared Alternating-Current Hoist of 1926

Electrical hoisting has eliminated the waste of steam which is so deplorably large wherever steam hoists are used at mines having little demand for steam for heating purposes even in the winter and none the rest of the year.

Machine cutting is now standard practice in coal mines. The electric undercutter is the type in general use in the United States, though occasionally the overcutter is used, but the development of the mining machine is one of the phenomena of coal mining. From a crude, bunglesome and unreliable machine as originally built, this mechanism has been improved in its structural and mechanical elements until today it is a marvel of concentrated power, compactness and efficiency. It is easily operated and transported from place to place, is able to cut coal of practically any degree of hardness, can be used in very low seams or tight places and as furnished by the manufacturers in 1926 is truly a testimonial of progress in mechanical engineering and the genius of the men engaged in its design and manufacture.



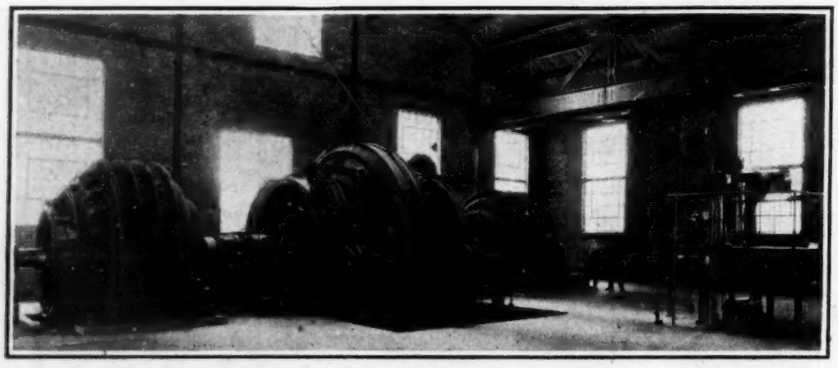
Direct-Connected Steam Hoist Becoming Obsolete

Mine managers seemed at one time to regard labor cost as the sole object of jealous care. Steam cost did not trouble them, especially if it was wasted in an engine. The wreaths of condensed steam around the plant and the pulsations with which it escaped delighted them, as exhibitions of power and action do every one. They did not stop to think of the wasted energy.

Where Shearing Helps

Shearing coal on ribs and center is a great help to the domestic-coal operator and appears to increase the percentage of lump coal when used as an adjunct to mechanical loading. Experiments in the Illinois and Pennsylvania fields during 1926 indicate that with shearing the gain in lump is so great that it is not offset by the increase in bug dust and that the coal after shooting lies in much better position for attack by the mechanical loader.

Shooting has received attention of the operator primarily because of his desire to reduce the percentage of screenings, but also because he



Direct-Connected Direct-Current Hoist of 1926

Large tonnages demand quick hoisting. The modern winder must not only accelerate and hoist the load rapidly but must do it with economy of operation. With certainty also, but then almost all hoists have reliability built into them. At most mines the hoist is "100 per cent" dependable, but when one gets below into the mine one soon finds that something is wrong there. Apparently haulage is quite frequently only "75 per cent" dependable or less. Reliability has not been built into it as it has been into the hoist.

desires to reduce the explosive hazard. The powder companies now find it profitable to furnish an expert in the use of powder and placing of shots to any operator desiring to better conditions, with the result that many miners now know how to place their holes and how much powder to use to get the maximum tonnage of coal per keg of powder and the lowest percentage of screenings.

The campaign of educating the miner in shooting gains momentum each year because the desire of the operator to produce more lump with greater safety is aided by the clamor of the miner for an explosive that will bring down the most coal and the desire of the powder company to satisfy or gain a customer. This happy situation may well be left to find its own solution.

EXPLOSIVES PASSING?

Shooting coal by explosives may soon be displaced by a new process now in operation in the Saline County field of Illinois. Carbon dioxide at a pressure of 2,000 lb. per square inch is placed in a 3½ x 30-in. steel cylinder which is inserted and tamped into a shothole in the coal seam. This is released by an electric current of about 125 volts which generates enough heat in the heating element or resistance contained within the cartridge to volatilize the compressed gas and release it through a rupturing diaphragm at a pressure of some 30,000 lb. per sq.in., thereby expending its energy on the seam of coal.

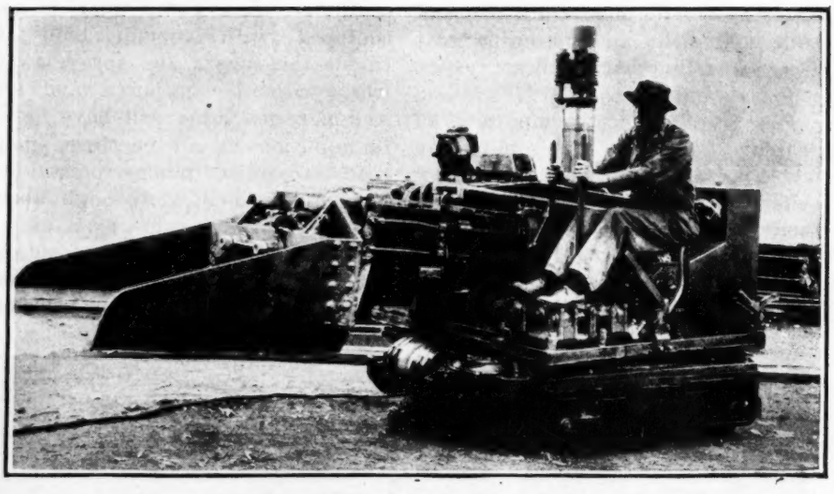
Actual experience after several years of experiment and demonstration of several hundred shots has shown conclusively that the coal may be brought down by this method. As there is no impact or shock the quantity of small coal made is less than half that made by an explosion of black powder. An inert gas being used, no flame can issue from the hole, so the process is ideal for safety. In a recent demonstration at a mine working a 6-ft. seam, undercut 6 ft. a carbon-dioxide shot brought down about 20 tons of coal. This may be taken as a fair average in coal of that thickness.

This startling development in bringing down coal at the working face has been discovered and practically perfected in the last year, but just what will be its application to the coal mines of the country with radically different seam conditions can be foretold only with difficulty. However, its entrance into the field of coal mining seems to be in accord with the renaissance of the industry, and sure to come, for it offers infinite possibilities of meeting our larger problems such as continuous shooting, concentrated mining, absolute safety from shots, elimination of bug dust and higher percentages of coal of large size.

SCIENTIFIC SURVEYING

Coal mines today are surveyed by methods greatly different from those formerly used, principally in the fact that the engineer now has as much to do with the future workings as he has with those in operation or the places worked out and abandoned. The engineer was usually hired to make survey of the existing workings about once a year, to plot them and furnish a map for the state inspector, as required by law. There his services terminated. Today, however, he not only surveys the old workings but projects the new and sights the rooms and entries in comformity with the projections.

In other words, instead of merely showing a map of work done, be it good or bad, he designs the system of haulage, ventilation and extraction, all relative to the known seam and surface conditions, plots these future operations on his maps and by setting sights directs the workings so as to conform as closely as practical considerations admit to his carefully considered plan of attack. This kind of surveying elevates the surveyor from merely an instrument man recording dead data to the realm of the mining engineer, with capacity and vision to determine what shall be done for maximum safety,

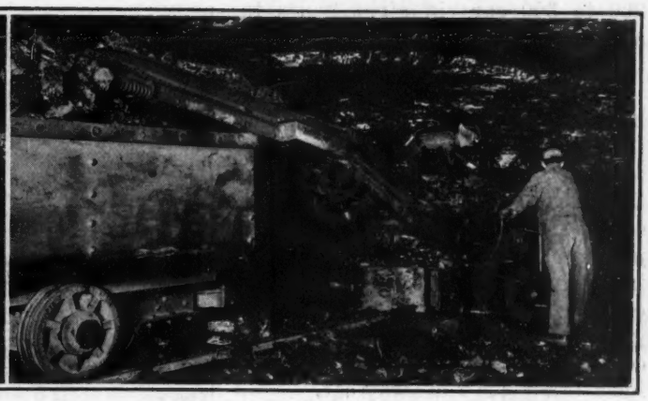


One of the Many Successful Loading Machines of 1926

In the operation of this machine the center post is thrust by hydraulic power against the roof, and the whole mechanism revolves around that axis. The shovel is lowered to the level of the floor of the mines and pushed forward under the coal. It is then raised and the whole machine revolved about the center post till the shovel is over the car. Its contents are then dumped.

Loading Machine Does Away with This Drudgery

For years it was thought that coal-mine work was too scattered and the workings too low to do away with hand-loading. But means are being found to make profitable the introduction of machines. Concentrated mining, scheduled hauling and mechanisms designed for low places have made the "strong-arm methods" illustrated in this picture unnecessary and will soon make them obsolete.



Hand that Rocks the Lever Rules the World

Today the throwing of levers meets almost every problem of labor. The emblem of the worker will, hereafter, be the lever and not the hammer. Labor-easing appliances take the strain out of the daily task, and meanwhile the productivity of the workman is increased. The loader on the right can handle, at one time, many lumps like the big one in the left illustration. The output per man is thus greatly increased.

extraction and minimum costs with full consideration for all controlling factors such as water, gas, surface, grades, roof, etc.

The new methods of caging and hoisting coal at up-to-date mines are radically different from those in use at the older mines. The stationary cage was replaced by the self dumper. This type of cage seems destined to give way at new mines to the more modern and latest design of skip adapted to coal-mine service and conditions. However, most mines are still equipped with cages. Coal will continue to be hoisted at most mines by this means because of first cost, simplicity of bottom design, small output, depth of seam and other controlling factors.

Improvements in Hoisting

At mines where self-dumping cages are used, great improvements have been made in the methods of caging coal, in the use of automatic stops and caging machines and in the design and detail of the cage itself. This type of cage is now used at mines where output demands require five and six dumps per minute and rope speeds up to 5,000 ft. per min. The fact that these conditions of severe service are met constantly and with small maintenance cost at hundreds of mines is ample proof that the cage maker has kept pace in the march of progress.

The preparation of coal in the tipple is a subject on which books can and have been written. Suffice it to say here that no tonnage has been too large, and no specification from the sales department has been so exacting as to "stump" the engineer designing this class of equipment. Screens, picking tables, rescreeners etc., have been constructed for handling outputs up to 15,000 tons in eight hours. All over the United States are dozens of smooth-working installations operating under all sorts of conditions and each a testimonial to the advance in the art of tipple design.

Cleaning Problems

Cleaning the smaller sizes, that is coal too small to be effectively picked by hand, is a problem to be solved after a study of the requirements and the characteristics of the raw coal in each individual case. Sometimes conditions inhibit the use of water for washing and compel dry treatment or vice versa, but satisfactory results have been obtained with each method. The exhaustion of the higher class and cleaner seams with resultant necessity for mining coals of higher sulphur and ash content will undoubtedly lead to further development along these lines and the more general use of washing or cleaning facilities at the average mine of the future.

The hoisting engine is now an institution in itself and has been developed from the ancient geared steam engine with cylindrical, wood-lagged drum, to the modern direct-connected compound steam-operated unit with cast-steel, grooved, cylindro-conical drums of marvelous speed and ease of handling. The steam engine, however, is rapidly giving way to the electrically operated hoist either via fly wheel and direct-current motors for larger operation or geared to motor for smaller capacities. In this field the advance in design and construction has been most impressive and is a brilliant page in the story of engineering achievements.

Central Station Service

Power supply is rapidly becoming a matter of purchased electric energy from sources outside the coal operation and the trend towards this system has been general all over the country. The use of electricity from service stations has made the recording meter an instrument of considerable interest to the coal-mine operator and has automatically brought about refinements and adjustments in distribution and use of the current that would probably not have been made when the power was furnished by the mine plant where accurate or reliable costs were seldom obtained.

The mine power plant is by no means obsolete and where ample water supply is available, plus facilities for burning picking table refuse etc. it is often more economical for the operator to make his own power, but load factors, continuity of operations etc. need due consideration. Each operation must be considered individually. Although the average coal-mine power plant is a splendid example of what not to do in the generation and use of steam, still it is nevertheless true that in all newer mine installations and at modern collieries there has been marked improvement in this important department.

Railroad cars under the tipple may now be controlled by one man operating a retarder instead of a man on each brake and several wielding chocks or sprags under the wheels. It is now possible to handle from

200 to 300 cars in eight hours to and from the tipple by means of these retarders, with only one man, though, of course, it is necessary to have men on empties and loads bring the cars to the tipple and drop them to the storage tracks. Some of the more ambitious operations are equipped with shunter locomotives to perform this car-supply service, and in several cases these engines, either electrical or steam, operate on flat grades which eliminate the initial cost of high line embankments and incidentally the run-away car.

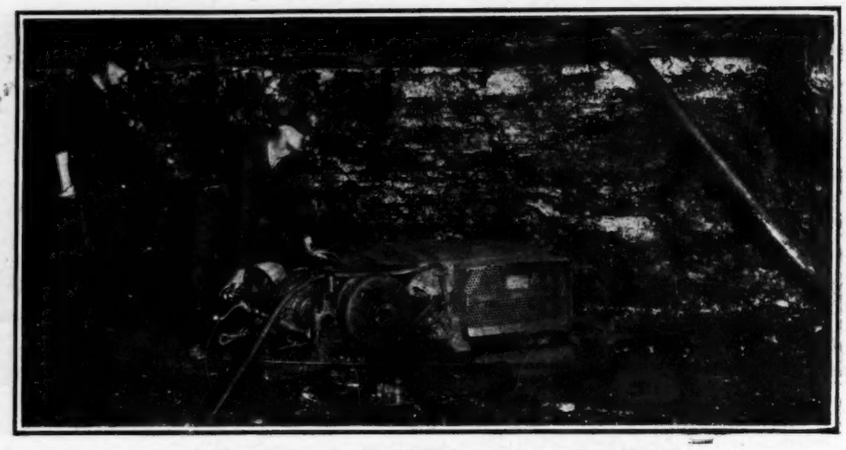
MORE COMFORTS FOR MEN

Washrooms are now built with a view to permanency and sanitation with hot and cold water, toilet facilities, overhead hangers for clothes in place of the floor locker and building designed only for rapid accommodation of men. The washhouse has now become a recognized institution at a well-managed mine. No doubt its use by the employees pays dividends to the employer by the betterment in the morale of the men.

The shops at a modern mine are equipped with the machinery needed for ordinary repairs and maintenance, such as lathes, presses, forges, emery wheels, power hammer etc. Bit-sharpening machines that do the work of ten or more blacksmiths and are operated by one man are considered necessary units in a well-planned shop. Except in isolated districts, it is not considered economy to equip the shops at mines for the repair of major equipment such as hoists, pumps, motors, etc. as this work is required only occasionally and may be better handled at commercial shops in nearby cities or at the factory of the manufacturer, thereby avoiding the initial expense of purchasing a machine that will be used only occasionally.

HOUSING PROBLEMS

Housing employees especially in isolated mining camps is a large problem in itself and may be considered here only with the statement that vast improvement has been made in the type of house, its construction details and the general arrangement of the dwellings themselves. Modern mining towns now exhibit some effort towards variety of design and toward the placement of buildings to conform to the natural contours and to the countryside. The string of box-like structures all set in a row, so common to the old-time camp is no longer customary. Sanitary facilities, good water, electric lights and the like are now ordinary features of an up-to-date mining company's housing plan.



A Revolution in Coal Mining Almost Completed

Even more revolutionary than the machine loader was the kerfcutter, whether undercutter, top cutter, or a cutter at some intermediate level. Once there were those who did not favor it and who questioned its ultimate success. But it arrived. Today the mechanical loader is merely adding another type of machine to a mine already extensively mechanicalized and having men in its workings who have run both cutters and automobiles. So the machine loader should arrive even faster than the kerfcutter.

Transportation of employees to and from the mine has usually been accomplished by miners' trains and though these are still in evidence in many sections of the country, the automobile and the good roads programs promise to eliminate the train before many years. The advantages of the automobile for transport at mines are too numerous to mention, but the one fact that it enables the miner to live in larger centers of population where good schools are available for his children, is sufficient inducement alone for the better class of miner to use this means of getting to and from his work and home.

There has been no signal improvement in the methods of placing timbers in the coal mines; the customary crossbar with legs in narrow work and the ordinary prop in rooms still being in common use. Occasionally one may notice systematic placing of props in rooms but not often, though this, of course, is done and is necessary in long-face work.

WOOD PRESERVATION GROWS

Treating ties, cross-bars and legs both by creosote and chloride of zinc solution is becoming quite common in certain fields, notably in sections where the cost of timber is high. In southern Illinois creosote is the prevailing medium and in Indiana zinc seems to have the preference for mine ties. Room ties and short-lived entry ties are often of steel, and with the constantly increasing cost of timber, steel ties seem destined to grow in popularity.

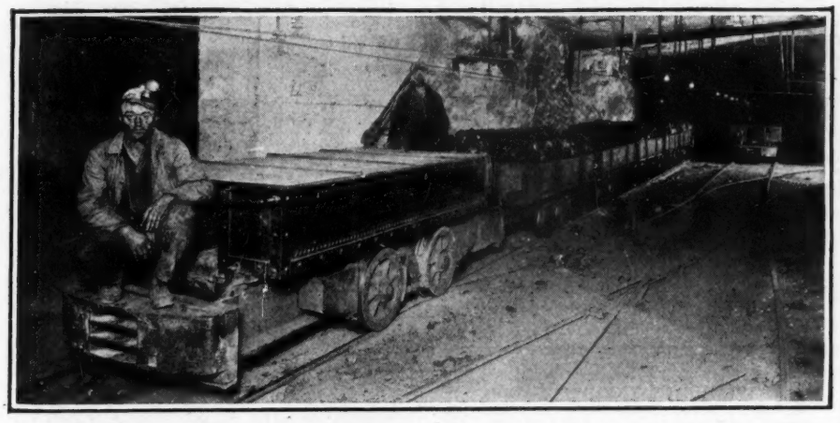
In the mine office the improvement in methods is quite noticeable. Few offices now are without the adding machine, typewriter, slide rule, loose-leaf record books, printed forms for cost sheet, payroll, etc., and all the intriguing products of the stationers' skill.

Telephone communication is provided for every section of the underground works, for each department on the surface, for the doctor, supply houses and main office.

BETTER OFFICE DESIGN

Offices at mines are now designed and built with full consideration for the problems of filing space, drafting tables for large mine maps, and windows, corridors, ingress and egress for rapid handling of large numbers of men on paydays. It is not uncommon nowadays to see 500 or 600 men paid off at a mine in half the time the same or smaller crews could be handled at a mine where this important detail had not been considered in the building layout.

The direction of the working force and the conduct of ordinary underground operations is usually done by the mine manager or pit boss working under the superintendent and responsible in almost every conceivable manner to the state, the county and the company and, in the union fields, charged with the task of strict conformity to the contract. It takes a good man to live up to all these requirements as all parties concerned, excepting the mine manager himself, seem to take particular delight in adding each year to the laws, rules



Storage-Battery Locomotives Made Great Strides in 1926

Accumulators have a big future in mining, though thus far they have had application mainly to haulage. This storage-battery locomotive can be charged and can be run, if desired from the trolley wire. Note the number of lights on the roadway which afford increased safety and greater rapidity in switch throwing.

and regulations under which he must operate. The boss of a mine has developed into a walking encyclopedia with all sorts of necessary certificates of competency from various authorities but with only leather medals and a mighty small salary. In this department the coal-mining industry has made no progress, and this long suffering individual is due for recognition via the payroll, and none other. If it is true that men are compensated for their knowledge and responsibilities then this official surely comes within the sacred circle of that preferential class.

Inspectors Well Qualified

The state inspectors are appointed after strict examination of their qualifications as practical mining men. As a general rule, they are exceptionally competent judges of underground operations, as respects other matters as well as safety. They are diligent in their efforts to keep the mines of their district in line with all recognized rules of safety. Their criticisms and recommendations after an inspection of the workings should, and now do, receive the most respectful and serious consideration.

Two Departments Fusing

One of the most promising indications of a better future for the industry lies in the fact that the management of coal mines is learning to appreciate the value of engineering and also that the engineer has come to a better understanding of the practical man's problems. In fact, a sort of fusion is going on between the two departments—engineering and operation. The mine managers are developing the technical, and the engineer the practical, side of their respective fields with the happy results that might be expected from such an ideal combination, or adjustment, of the fields of theory and practice.

The future of coal mining lies along the lines of good engineering, in the design of machinery to reduce labor costs, in the arrangement of workings for better extraction and machine loading, in the work of coordinating the numerous items that go to make up the complete whole. The operators' continued growth of confidence in the engineer is the outstanding sign that safer and better coal mines will be found in the future.

Certainty in Operation

Every indication in 1926 pointed to a desire for 100-per cent effectiveness in performance. No longer is the main idea to get the most possible service at all times from each piece of equipment, but rather to have it more than equal to the demands made on it and to be able to count on it to do with certainty and promptitude what in a scheduled manner it is called upon to perform. In fact, an effort is made to prevent motormen from hitching to locomotives any more than a scheduled number of cars and from going over the road at excessive speeds and from starting to pull out of the sidetrack without regard to the time and routing of other trips. Men are employed to patrol the mine roads. They may do but little actual work but the delays they save, the operators are confident, save much time. The old "Pikes Peak or bust" spirit has given way to regulated effort.

Output and Value of Soft Coal by Stripping Operations In the United States in 1925*

State	Number of Strip Pits	Number of Shovels	Net Tons Mined by Stripping	Total Net Tons Produced (Same Mines)	Total Value (All Coal)	Average Value per Ton	Men Employed — Underground — Miners, Loaders§	Men Employed — Underground — All Others†	Men Employed — Surface	Men Employed — Total	Days Worked	Per Cent of State Total Mined by Stripping
Alabama	11	19	403,682	732,682	$1,460,000	$1.99	306	117	415	838	215	2.0
Arkansas	8	15	199,092	199,092	696,000	3.50	...	...	347	347	106	16.3
Georgia	1	3	59,574	66,174	220,000	3.32	48	19	70	137	220	90.0
Illinois	19	46	3,398,159	3,469,267	6,019,000	1.73	60	13	1,037	1,110	207	5.1
Indiana	22	57	3,269,386	3,269,386	5,624,000	1.72	...	...	1,540	1,540	181	15.4
Kansas	38	33	1,123,950	1,123,950	2,826,000	2.51	...	...	710	710	142	24.8
Kentucky	11	29	1,375,744	1,394,744	1,926,000	1.38	25	10	819	854	175	2.5
Missouri	21	27	1,202,201	1,202,201	3,219,000	2.68	...	...	782	782	168	44.6
North Dakota	15	11	506,393	508,035	911,000	1.79	3	2	269	274	148	38.2
Ohio	37	78	3,059,324	3,091,166	4,789,000	1.55	47	13	1,478	1,538	169	10.9
Oklahoma	9	17	395,496	443,340	1,400,000	3.16	19	10	439	468	238	17.0
Pennsylvania	25	39	800,615	1,214,705	2,049,000	1.69	329	41	535	905	197	.6
West Virginia	5	8	272,082	273,375	332,000	1.21	7	3	102	112	192	.2
Other states‡	5	7	805,209	805,209	1,139,000	1.41	...	...	126	126	216	5.3
Total	227	389	16,870,907	17,793,326	$32,610,000	$1.83	844	228	8,669	9,741	182	3.2

*For mines that recover coal both by stripping and by underground operations. The returns do not permit separating men engaged in stripping from those engaged in other work. For this reason the figures of men employed represent all persons working at these mines, including those underground. The total tons produced by both methods at these same mines also are shown.

†Includes haulage and track men.

‡California, Iowa, Montana, Texas and Wyoming.

§And shotfirers.

Compiled by U. S. Bureau of Mines.

Congressional Campaign To Establish Regulation of Coal Industry Foreseen in 1927

By Walter H. Cunningham
Chairman, Committee on Government Relations, National Coal Association

Movement to control coal seen as serious effort to link American industries to Washington bureaucracy. National Coal Association opposed to compulsory consolidations.

THE SECOND SESSION of the 69th Congress had been in progress only a few days when a member of the lower house inquired of an Eastern colleague if the latter planned to continue agitation for coal legislation to which he had been a party during the first session.

The answer was amazingly frank, and painfully, or pleasantly, depending on the color of one's glasses, to the point. The Representative from the Atlantic seaboard replied bluntly that he was not especially interested in coal legislation until the next election. At that time, he opined, a little noise about it in condemnation of the "coal barons" wouldn't do a bit of harm.

Again let me cite the statement made by a member of the Cabinet. This was also made a few days after Congress had convened and at a public meeting. The Cabinet member suggested that the proper thing for the coal operators to do was to get together to reduce the number of coal mining operations and controlling production and prices. As a prominent operator remarked from the floor of the meeting, after the conclusion of the address, if the operators followed the advice of the Cabinet member they would be obliged to do one of two things, go either to Atlanta or Leavenworth. So far as control of the number of mines, the quantity of production and prices is concerned, operators well know the provisions of the anti-trust laws, and inasmuch as the speaker did not advocate any exemption thereunder for the bituminous industry, his remarks, without questioning his sincerity, must be taken merely as a gesture.

A "Unified Labor Policy?"

Furthermore, this Cabinet member declared for "a unified labor policy." Neither the public nor the operators would like to see "a unified labor policy." England has just had a bitter experience with that sort of a policy. The American public is now more nearly free from any danger of a fuel shortage just because the bituminous coal industry does not have "a unified labor policy." Approximately 70 per cent of the bituminous coal produced last summer came from non-union operations, which could be geared up to meet the ordinary fuel demands. Realization of the hopes of those who now advocate "a unified labor policy," would bring about a condition wherein the nation would indeed be in constant jeopardy.

Too Much Loose Thinking

I have referred to these statements, the one by a member of Congress and the other by a member of the President's Cabinet, to indicate the loose thinking which sometimes characterizes treatment of the coal industry. Frequently, I have likened the coal issue to a football kicked up and down the halls of Congress and on the public forum.

The entire picture, however, is not so black as some would paint it. There are stout ranks of loyal citizens in both branches of Congress, who are opposed to hampering legislation for the business interests of the country, and it is due to their unwavering support that the coal industry is not hog-tied. The Senators and Representatives whom I have in mind have frequently and freely testified to the invaluable support they have received from the National Coal Association, the nation-wide organization of bituminous operators, as regards complete information. Without such support, they frankly state they would have been unable to stem the movement looking toward control of the industry; that is to say, had it not been for the continuing efforts of the National Coal Association the coal industry probably would today be subject to regulation. That is a fact, acknowledged by all who are in any measure familiar with the continued effort the National has made since 1917.

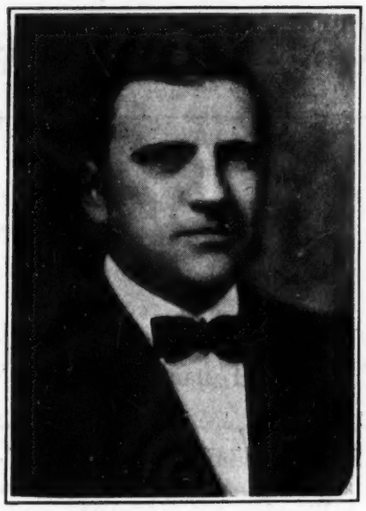
It is extremely difficult to separate the advocates of governmental interference into different classes. We all know, broadly speaking, that there is really no distinction respecting the ultimate goal of their efforts, which is nationalization of the coal industry. Although they may loudly disclaim any such intention, government control of any sort will logically lead there. Then, indeed, we would have a "unified labor policy." Once let the bars down and socialistic tendencies will move forward. Of course, before this condition actually materialized, other lines of business, having seen the writing on the wall, would be on the offensive, but how successful their efforts would be, once the front-line trenches in the form of the coal industry had fallen, is questionable.

Awake to Dangers

Bituminous coal operators sense the danger. That is one reason why they are banded together in the National Coal Association. It is always well to have a measure of optimism, but coal operators cannot afford to be Micawbers, confident that the turn of the wheel will be in their favor. They know that the industry would today be practically under the control of Washington bureaucracy had it not been for their constant vigilance.

At the third annual meeting of the association, held in Atlantic City in 1920, the following resolution, clearly defining the position of the organization, was adopted:

"The bituminous coal industry of the United States, represented by the National Coal Association, is unalterably opposed to the enactment of



Walter H. Cunningham

any legislation imposing additional regulation upon a commerce and industry and is especially opposed to legislation which singles out one industry for regulation by special commission."

This resolution has been reaffirmed in principle by succeeding meetings of the association. There have been no developments to warrant a change of policy. Rather has the wisdom of that policy been demonstrated with respect both to the unreasonable demands of federal commissions upon business and to the experience of the Government of Great Britain.

WANTED—ANOTHER STAR!

I am reminded of the captain, who, pointing to the North Star, said to a green hand at the wheel, "Keep her headed for that star. I'm going below to get some sleep." By and by he was awakened by a pounding on the door.

"Captain, come up quick and give me a new star. I've passed that one."

Sometimes, in these days of specious arguments, business men, with a definite policy, are diverted imperceptibly and unconsciously by various influences until they are going in the opposite direction and want a new star. Possibly this may be the case with some coal operators, whose need is to get back on the course and be guided by the old star, represented in this instance by the sound common sense of the resolution quoted.

There are conflicting opinions as to danger of legislation at this session of Congress. A few days later one will be in a much better position to express opinion on that subject. There is no conflict in opinion, however, that a struggle looms ahead of us in the 70th Congress and that during the winter of 1927-28 extraordinary efforts will be made to foist the most drastic regulation possible on the industry.

To counteract this program we are extending every proper effort. We know that our continued security lies in enlightened public opinion and because we have nothing to conceal and have everything to gain by laying all cards on the table, we are doing that very thing whenever, wherever and with whomever possible. Officers of the national organization and individual operators are making it a point to address commercial and civic clubs and business men's luncheons. Full and frank discussion of the entire industry by the newspapers is being encouraged. This educational effort through our officers, committees and members is limited to the ordinary activities of the association. If funds were available therefor a more extensive educational effort might be made and I am reminded in this connection that the annual appropriation of a kindred industry, to be used solely for matrix and boiler-plate articles for newspapers, is in the sum of $100,000.

Consolidation suggestions have been made not only by official Washington but by others in the hope that the industry would pass into larger units of operation. That is a process of business evolution and comes as circumstances and conditions warrant and cannot be brought about with the waving of any magic wand or at the instance of governmental suggestion. Such consolidations as would effect economy and flexibility of operation are to be desired. In every producing field changes of ownership have been made and are under way which indicate distinct progress along this line.

In this article I am not indulging in any detailed criticism of the Parker and the Copeland bills. Thanks to the National Coal Association, every operator in the country is thoroughly familiar with the provisions of each of these measures. A former bill on coal by Representative Parker included "other mineral and manufactured fuels," which would have covered oil, gas, etc., but that provision does not appear in his new bill. One can properly infer that this is in line with an effort to link American industries one at a time to Washington bureaucracy. The effort may be singular but the necessity for common defense is plural. No one can profess ignorance of the danger and none can accuse the organization of the industry on the score of negligence.

As long as there is a Paul Revere in Washington in the sense that the industry is represented by an efficient organization, fully alive to its responsibilities and alert in their fulfillment, there is promise that the expediency of politicians may not prevail.

SETBACK OR DEATH BLOW FOR REGULATION OF COAL INDUSTRY?

Coal legislation at this session of Congress ran against a barrier of unexpected strength on Jan. 13 when the Committee on Interstate and Foreign Commerce of the House of Representatives voted, 16 to 6, against reporting the Parker bill favorably. Characterizing this action as a "definite, decisive setback," Representative Wyant, of Greensburg, Pa., said "the agitation which has been raging since the inception of the anthracite strike in 1925 to regulate the coal industry has been not only the most nonsensical but the most vicious." Congressman Parker, author of the bill, warned the operators, however, "that the vote of the committee is not the final verdict of the country and that the way they conduct their industry in the next few months will be the thing which really will decide whether or not the undercurrent of public feeling rises to a point where it will overwhelm their opposition and force some kind of regulation." Senator Copeland has introduced in the upper house a bill in the nature of a substitute for his previous bill, the main features of which are those of the Parker bill, with several minor changes.

Increased Consumption Through Coal Processing Waits Upon Petroleum Exhaustion

By A. C. Fieldner
Chief Chemist, U. S. Bureau of Mines*

Experimental work in carbonization, however, points way to manufactured "smokeless" fuel for household use and recovery of the saleable byproducts at industrial plants.

ONE of the outstanding present-day trends is the growing interest in fuel research and the development of new processes for the preparation, transformation, and utilization of coal. The public generally is beginning to appreciate the basic value of a nation's fuel resources. The common use of the automobile has demonstrated to everyone the utility of fuels of higher form values than raw coal. The production of smokeless solid fuel and gas by carbonizing coal is an old process, but the conversion of coal into liquid fuels is new and promises to make up any future shortage occasioned by the exhaustion of our petroleum resources.

Interest in low-temperature carbonization of coal has continued unabated during the last year, but no entirely new processes have been announced. The frank publication of the difficulties encountered in large-scale work, such as the recent papers by Caracristi[1] and by Laucks,[2] is a big step in the direction of solving the mechanical difficulties of low-temperature carbonization. Brownlie[3,9] of London, England, and Thau[4,5,6,7,8] of Halle-Saale, Germany, have contributed a number of papers giving detailed descriptions of various processes.

No low-temperature carbonization plant anywhere in the world (excepting certain brown-coal plants in Germany) can yet be said to be in successful commercial operation; nor can it be said that success is much nearer than a year ago. Nevertheless, progress has been made in a better understanding of the great importance of the physical and chemical properties of the coal to be carbonized in relation to the process and retort design. Moreover, experimentation has taken two definite trends, viz., the production of a briquetted smokeless domestic fuel and the precarbonizing of power-plant fuel to recover salable byproducts.

A. C. Fieldner

In the United States, the low-temperature processes[10] of interests may be summarized as follows:

A. For the production of smokeless domestic fuel:

1. The Carbocoal process of the Consolidation Coal Products Co., Fairmont, W. Va., as modified by C. V. McIntire.
2. The Greene-Laucks process of the Old Ben Coal Corporation, Illinois.
3. The Parr process at the University of Illinois, Urbana, Ill.

B. For the pre-carbonization of power-plant fuel:

4. McEwen-Runge process of the International Combustion Engineering Corporation at Milwaukee, Wis.
5. The Piron-Caracristi process at the Ford Motor Co., Walkerville, Ont.

Carbocoal Process.—The Carbocoal plant has continued operation during the year; in fact, it is the only low-temperature plant that, to the knowledge of the writer, has achieved continuous operating success. The process is conducted in three stages consisting of primary carbonization, briquetting with pitch binder, and re-carbonizing the briquets in the secondary retorts. McIntire,[11] the engineer in charge, seems to have overcome the difficulties which caused the failure of the original Carbocoal process. The discharged material from the primary retort is, to a considerable extent, in sizable lumps.

The secondary stage carbonization retorts completed during the past year recarbonize the briquets in 30 min. at 1,200 deg. F., and produce clean smokeless briquets which stand rough handling. They are easily ignited and burn with a red glow and a short blue flame in an open grate fire. They have a high degree of reactivity so that combustion is maintained with very low draft. They should find a ready market in our Eastern cities where people are accustomed to burning anthracite but they cannot be considered a com-

*Published with approval of the Director, U. S. Bureau of Mines.

[1]Caracristi, V. Z., "Low-Temperature Carbonization;" *Jour. Franklin Institute*, vol. 202 (1926), pp. 323-336.

[2]Laucks, I. F., "The Screw as a Carbonizing Machine;" Paper read at Philadelphia meeting, American Chemical Society, Sept. 9, 1926.

[3]Brownlie, David, "Low-Temperature Carbonization;" South Wales Institute of Engrs., 1926.

[4]Thau, A., "Low-Temperature Process Produces Hard Coke." *Chem. and Met. Eng.*, vol. 33 (1926), pp. 227-228. The Dobbelstein oven and its operations are described.

[5]"Temperature Limits and Effects in Distillation and Coking;" *Internationale Bergwirtschaft*, vol. 1 (1926), pp. 1-110.

[6]"Further Developments in Retorts for Carbonizing Brown Coal;" *Braunkohle*, vol. 24 (1925) pp. 1-18.

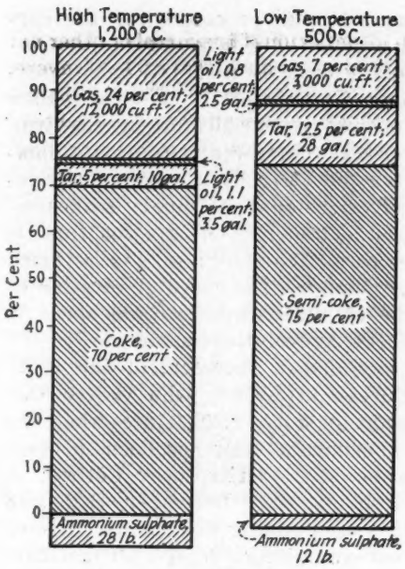
[7]"The Distillation of Coal and Tar with the Use of Metal Bath;" *Glückauf*, vol. 61 (1925), pp. 821-831.

[8]"Carbonization with Circulating Gases; *Glückauf*, vol. 62 (1926), pp. 668-677; 697-703. Description of Merz-McLellan, Midland Coal Products, Hanl, Limberg, Lurgi, Seidenschnur, Pintsch, and other processes.

[9]Brownlie, David, "Low-Temperature Carbonization;" Trans. Inst. of Min. Engrs., vol. 71, part 1, 1926, pp. 181-247.

[10]Fieldner, A. C., "Low-Temperature Carbonization of Coal;" Bureau of Mines Technical Paper 396 (1926).

[11]McIntire, C. V., "Development of Low-Temperature Distillation at Fairmont, W. Va.;" Proc. International Coal Conference. Carnegie Institute of Technology, held Nov. 15-19, 1926.


High Temperature
1,200° C.
Low Temperature
500° C.
Per Cent
Gas, 24 per cent; 12,000 cu.ft.
Light oil, 0.8 percent; 2.5 gal.
Tar, 5 percent; 10 gal.
Light oil, 1.1 percent; 3.5 gal.
Coke, 70 per cent
Ammonium sulphate, 28 lb.
Gas, 7 per cent; 3,000 cu.ft.
Tar, 12.5 per cent; 28 gal.
Semi-coke, 75 per cent
Ammonium sulphate, 12 lb.

How Yields from High- and Low-Temperature Coking Distillation Processes Compare

petitive fuel of bituminous or semi-bituminous coal. The question to be answered is: Will the public buy the briquets at the price of anthracite?

Carbonizing Illinois Coal

Greene - Laucks Process. — The Greene-Laucks process also aims to produce a lump domestic fuel, but in a single stage of carbonization without briquetting. Slack coal is fed into the bottom of a cast-iron vertical retort and is propelled upward by a screw conveyor or rotor; heat is applied outside the retort and within the hollow conveyor shaft. Experimentation[9] with a 36-in. diameter retort has resulted finally in a satisfactory design for producing a strong, dense semi-coke, much of which has a density greater than 1. A new experimental retort, 9 ft. in diameter with a rotor weighing 120,000 lb., is to be constructed at the mines of the Old Ben Coal Corporation in Franklin County, Illinois.

Parr Process. — Within the past year S. W. Parr, professor of applied chemistry, University of Illinois, has described his experimental plant at Urbana.[12] His process is designed to make a coherent coke from high-oxygen Illinois coals which are not considered suitable for use in standard high-temperature ovens. The coke produced by the Parr process is smokeless, kindles easily, responds readily to draft regulation, retains fire for long periods when banked, and has a strength and density which meet the commercial requirements of handling, shipping, and storage. The amount of breeze produced is negligible.

The University of Illinois has entered into contract with the Burgess Laboratories of Madison, Wis., for operating the process on a commercial scale. The next step will be the erection of a semi-commercial unit of approximately 100 tons per day capacity.

McEwen-Runge Process.[13]—No results are yet available from the 210-ton a day experimental plant for the low-temperature distillation of pulverized coal at the Lakeside plant of the Milwaukee Electric Railway & Light Co. This process goes to the ultimate extreme in rapid heat transfer to the coal and has possibilities of very high throughput in relatively low cost equipment, but the mechanical difficulties to be solved seem great, especially in separating the fine dust from the tar vapors.

Experimental work[14] is also in progress by A. H. White at the University of Michigan on the instantaneous carbonization of 20-mesh coal. F. S. Sinnatt in England has independently obtained results similar to those of White.

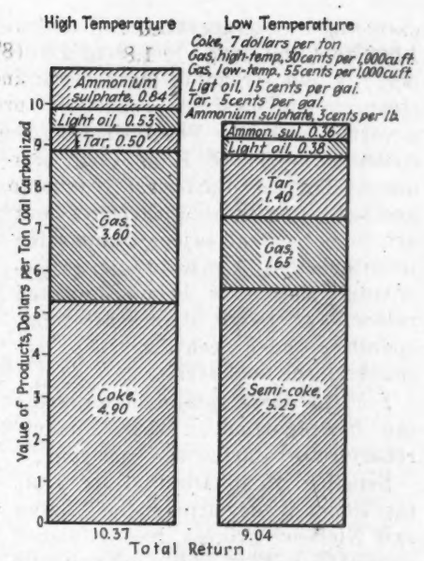
Piron - Caracristi Process. — Caracristi[1] and Piron[15] have published reports of the performance and the difficulties encountered in developing the Piron-Caracristi oven. However, despite the favorable reports regarding the solution of the technical difficulties, it is also reported that the Ford Motor Co. has discontinued further development work with these ovens.

England Experimenting

The principal large-scale experimental plants in England are the following:

A. For the production of smokeless domestic fuel:

1. The Parker plant of Low-Temperature Carbonization, Ltd., at Barugh, near Barnsley, Yorkshire.
2. The MacLaurin plant at the works of the Glasgow Gas Corp., Dalmarnock.
3. The Sutcliffe - Evans, or Pure Coal Briquet Process.



How Values of Products of Carbonization from Low- and High-Temperature Distillation Compare

4. The "Fusion" process of the Fusion Corporation.
5. Laing-Nielsen ("L & N") process of the Sensible Heat Distillation, Ltd., London.

B. For the precarbonization of power-plant fuel:

6. Merz and McLellan process at the Dunston Power Station, Newcastle-on-Tyne.

Low Temperature Carbonization, Ltd., has gone into the hands of the receiver and operations at the experimental plant at Barnsley have ceased. This was to be expected on account of the high cost of operating and maintaining these 4 to 5-in. cast-iron tube retorts.

The five MacLaurin units at the plant of the Glasgow Gas Corporation, have been operating intermittently and under some difficulties on account of the coal strike, mechanical troubles, and because of difficulty in disposing of the smokeless fuel at a price high enough to pay for the operations. It will be necessary to wait another year or two before judgment can be passed on the technical and commercial aspects of this process which seeks to make a smokeless domestic fuel by internal heating in a gas-producer style of carbonizer.

Strike Halts Study

The Sutcliffe-Evans, or Pure Coal Briquet, process is designed to make a dense, high-quality smokeless fuel briquet by compressing suitable mixtures of fine bituminous coal and coke breeze or non-coking coal by pressure alone, up to 10 tons per square inch. These briquets are then

[12]Parr, S. W., "The Constitution of Coal, Having Special Reference to Problems of Carbonization;" *Ind. and Eng. Chem.*, vol. 18 (1926), pp. 640-648.

[13]Runge, Walter, "The McEwen-Runge System for the Low-Temperature Carbonization of Coal;" Proc. International Coal Conference.

[14]White, Alfred H., "The Instantaneous Carbonization of Crushed Coal;" Proc. International Coal Conference.

[15]Piron, Emil, "The Piron Coal Distillation Process;" Proc. International Coal Conference.

carbonized at temperatures of about 1,600 to 1,850 deg. F. (870 to 1,010 deg. C.) by a stream of inert gas and steam in any desired proportion in a vertical retort. The operation is continuous. These Pure Coal briquets, like the Carbocoal briquets, are really artificial anthracites and are to be sold at prices comparable to anthracite. A new 100-ton experimental plant has been completed recently at Leigh, Lancashire, but operations have been delayed on account of the coal strike.

For the same reason no progress can be reported on the "Fusion" rotary retort during the past year.

Sensible Heat Distillation, Ltd., the company developing the "Laing and Nielsen" process, has published several reports[16,17,18,19,20] giving results of yields obtained in its 5-ton a day experimental plant at Barugh. The retort is of the rotary type, and the coal is heated by the sensible heat of products of combustion, producer gas, preheated distillation gases, or any combination of these. For the domestic fuel market the product would require briquetting. However, it would be suitable for power plants as it is. No commercial plants based on this process have yet been installed in England.

The Merz and McLellan retort at Newcastle-on-Tyne is the result of considerable development work in an attempt to precarbonize coal in direct connection with water-tube boilers, but nothing has been published regarding actual results.

Stick to Brown Coal

Development in low-temperature carbonization during the last year in Germany has been confined almost entirely to brown coal and lignite. Most of the new processes proposed are based on internal heating by circulating hot gases. The Seidenschnur and the Lurgi are the two best known of the processes in which hot products of combustion are circulated through the descending material in a shaft retort. A 25-ton a day Lurgi unit was recently installed in Greece. It is said to have passed a 4-week acceptance test in March, 1926. Another Lurgi experimental oven is to be installed at Saskatchewan, Canada, for trial on Canadian lignite.

To Recover Byproducts

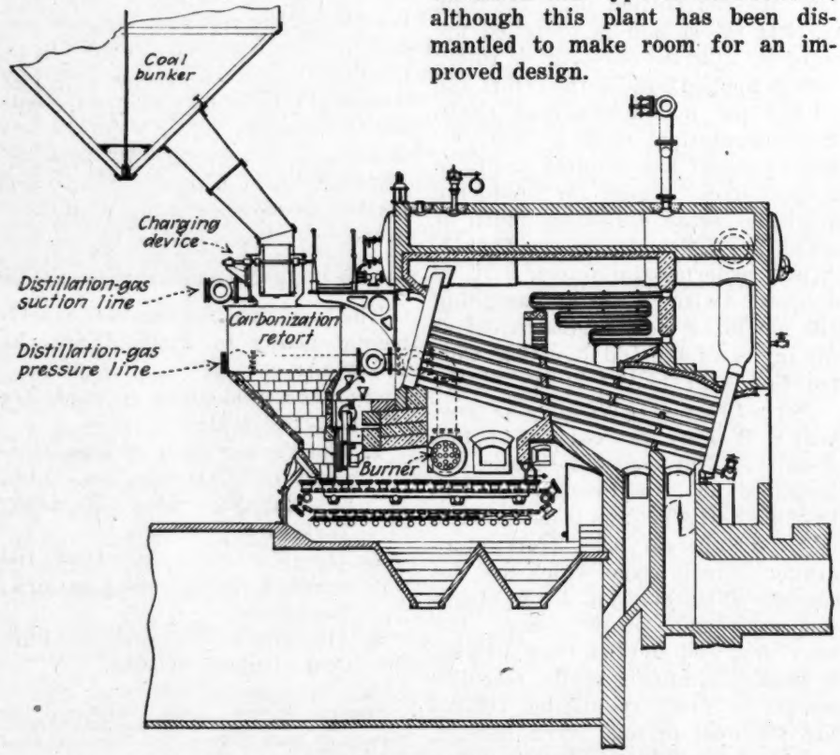
The Julius Pintsch Co. in Germany has a process similar to that of Merz and McLellan in England for precarbonizing coal for byproduct recovery in conjunction with stoker-fired boiler furnaces. Thau[5] has reported several installations of the Pintsch process in Upper Silesia operating in conjunction with boilers. Waste, shaly coal of 27 to 40 per cent ash and 7,800 to 9,000 B.t.u. is used; 18 to 20 gal. of tar are recovered per ton of coal. Another installation in Norway, in conjunction with a B. & W. boiler of 3,300 sq.ft. evaporating surface, precarbonizes a cannel coal from Spitzbergen with 18 per cent ash and a heating value of 11,600 B.t.u. The daily throughput of coal is 25 tons and the tar yield is 27 gal. per ton. Preliminary reports from these Pintsch plants, according to Thau, are promising. However, it is essential that the right kind of coal be used—namely, screened and sized non-coking coal from ½ to 6 in. High ash is not objectionable but the moisture should not exceed 20 per cent.

One of the newest large-scale experimental processes for the carbonization of brown coal or other non-coking coals is that of Kohlenveredlung Gesellschaft. This carbonizer consists essentially of a cast-iron vertical rotary retort 6½ ft. in diameter and 26 ft. high which slowly revolves inside a stationary malleable-iron cylinder. The coking time is between 20 and 30 min. and is varied by changing the speed of rotation of the cylinder whose normal speed is about 2 revolutions a minute.

Reinhardt Thiessen, of the U. S. Bureau of Mines, who visited this plant in July, 1926, states that one experimental unit has been in operation at Edderitz, near Cöthen, in Germany, since December, 1925, and they are building three more. Brown coal containing 50 per cent moisture is first dried to 15 per cent in a separate drier before being charged into the retort. The tar yield is said to average 12 per cent.

Not Yet Profitable

According to Mr. Thiessen the consensus in Germany is that low-temperature carbonization of bituminous coal is not yet profitable. The double rotary retort of the Kohlenscheidungs Gesellschaft at Karnap is considered to have come the nearest to solving the technical difficulties involved in this type of construction, although this plant has been dismantled to make room for an improved design.



The Pintsch System of Precarbonizing Boiler Fuel

In the early days of coal-processing, the production of a briquetted fuel for domestic sale was the primary, and usually the sole, objective. Today, however, precarbonizing at the power plant to recover salable byproducts before using the fuel for industrial purposes also has become an end. Considerable progress along this latter line has been made under the Pintsch system in Germany. The illustration shows the details of an inclined water tube boiler with a built-on precarbonizing retort.

[16] Nielsen, Harald, and Baker, Stanley, "Exothermic Reactions of Coals at Low-Temperatures;" *Gas Age-Record*, vol. 57 (1926), pp. 287-289.

[17] "Low-Temperature Solid Residuals as Powdered Fuels;" *Iron and Coal Trades Review*, vol. 113 (1926), pp. 34-36.

[18] Anon, "The 'L & N' Process of Low-Temperature Distillation;" *Iron and Coal Trades Review*, vol. 111, (1925), pp. 591-593.

[19] Anon, "Sensible Heat Distillation;" *Gas Journal* (London), Dec. 9, 1925.

[20] Nielsen, Harald, "Oil from Coal;" *Gas Journal* (London), vol. 174 (1926), pp. 591-592; 650-653; 732-735.

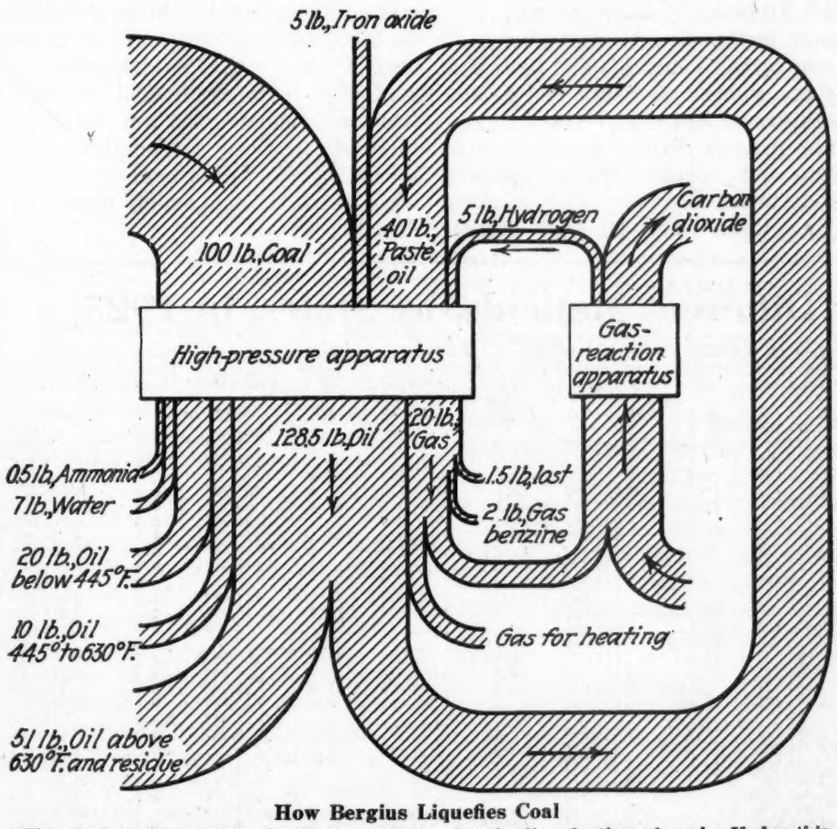
The only retort in Germany which produces a smokeless lump domestic fuel without briquetting is the Dobbelstein retort.[4] Several of these retorts of large size are reported under construction but no definite data are yet available on their performance and the durability of the mechanism.

Sainte-Claire Deville[21,22,23] has published several reports on the extensive low-temperature carbonization experiments conducted by the Sarre Mines, whose purpose is to make a low-volatile semi-coke which can be mixed with high-volatile bituminous coal to improve its coking properties. The semi-coke was made from a high-volatile gas coal which was carbonized in Salerni retorts which are of the externally heated, internally stirred type. It is also reported that a large-scale installation of Salerni retorts is being made at one of the Belgian power stations to precarbonize the boiler-plant fuel and extract byproducts.

BERGIUS PROCESS SUMMARIZED

In the Bergius process,[24,25] pulverized coal mixed with 5 per cent iron oxide and about 40 per cent of oil or tar to form a thick paste, is heated at 750 to 840 deg. F. in an atmosphere of hydrogen under a pressure of 150 to 250 atmospheres. Under these conditions the coal is converted into a black, tarry liquid which, on separation from the ash and undecomposed residue, yields from 30 to 50 per cent of crude oil, or 90 to 130 gal. per short ton of coal. Bergius reports a test on an Upper Silesian gas coal from which he obtained 140 gal. of crude oil per metric ton of dry coal. This crude oil on straight distillation and refining yielded 40 gal. of motor fuel, 50 gal. of Diesel engine oil, 35 gal. of fuel or creosoting oil, a pitch residue and 10,000 to 12,000 cu.ft. of gas of 550 B.t.u. per cu.ft heating value.

Experimental work conducted in a number of European laboratories, has confirmed the essential features of the process as reported by Bergius himself. At the International Coal Conference at Pittsburgh he said that the Badische-Anilin-und-Soda-fabrik is beginning the construction of a commercial Bergius plant in the central Germany brown-coal district, and the Gesellschaft für Teer Verwertung is building another plant in the Ruhr district. The combined output of these two plants is estimated at 1,000,000 barrels of liquid products per year. Although Bergius refers to these proposed installations as commercial plants they must be regarded as commercial scale experimentation. Two important factors have yet to be proved satisfactory—the autoclaves and the cost of hydrogen.



How Bergius Liquefies Coal

This diagram illustrates the Bergius process for the liquefaction of coal. Under this process, 1,000 lb. of gas-flame bituminous coal with an ash content not exceeding 6 per cent, plus the necessary admixtures of hydrogen and iron oxide, will yield 150 lb. of motor fuel, 200 lb. of fuel oil suitable for internal combustion engines, 60 lb. of lubricating oil, 80 lb. of industrial fuel oil, 235 lb. of gas, 75 lb. of water, 5 lb. of ammonia, 240 lb. of coke (with ash). The distillation and other losses in the process will absorb 55 lb. of the original coal charge.

NO IMMEDIATE INTEREST HERE

For the United States, the process will be of no interest until petroleum shortage forces the use of coal; then the Bergius process may be the principal means for getting oil from coal. European experiments have shown that lignite and sub-bituminous coal are the best raw materials, conversion being almost complete. Our Western states have large resources of these low-grade fuels. If we assume that 2 tons of coal yield 1 ton, or 6 barrels of crude oil, then 252 million tons of coal would be required to produce the 1925 production of 755,852,000 barrels of petroleum. In other words, our present bituminous coal mined per annum would need to be increased about 50 per cent.

The investigations of Patart[26] and Audibert[27] in France, and of Fischer[28] and the Badische-Anilin-und-Soda-fabrik in Germany, together with the production of methanol from carbon monoxide and hydrogen on a commercial scale by the latter, present another route from coal to motor fuel. The cost of manufacture reported from both French[26] and German[29] sources varies from 18 to 27 cents per gallon.

Road tests in Germany reported by Fischer and Tropsch[29] with a 4-cylinder truck and by Dumanois[11] in France

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[21] Deville, J. Sainte-Claire, "Investigations on the Low-Temperature Carbonization of Coal;" *Chimie et Industrie*, Sept. 1925, pp. 164-172. Description of results of investigations at the Sarre Mines with discussion of economics of process.

[22] "Investigations on Low-Temperature Carbonization at the Sarre Mines"; *Chimie et Industrie*, vol. 15 (1926), pp. 163-171. Results obtained with small Salerni retort.

[23] "Physico-Chemical Investigation of Four Liquid Fuels Prepared from Primary Tar Obtained from Waste Products of the Sarre Mines;" *Chaleur et Industrie*, vol. 6 (1925), pp. 311-312.

[24] Bergius, F., "The Transformation of Coal into Oil by Means of Hydrogenation;" Proc. International Coal Conference.

[25] "The Liquefaction of Coal;" *Zeit. Ver. Deutsch. Ing.*, vol. 69 (1925), pp. 1,313-1,320; 1,359-1,362.

[26] Patart, Georges, "A New Field of Catalysis Under High Pressure: Commercial Synthesis of Methanol;" *Chimie et Industrie*, vol. 13 (1925), pp. 179-185.

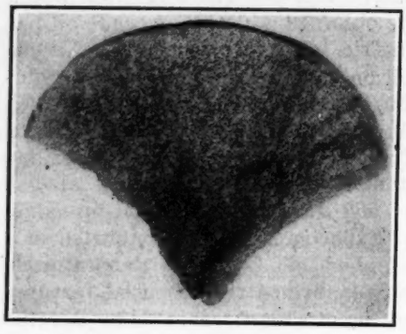
[27] Audibert, Etienne, "The Manufacture of Synthetic Liquid Fuels from Mixtures of Carbon and Hydrogen;" *Chimie et Industrie*, vol. 13 (1925), pp. 186-194. (Translated in *Fuel in Science and Practice*, vol. 5 (1926), pp. 170-177.)

[28] Fischer, Franz, and Tropsch, Hans, "Ueber die Herstellung von Synthol durch Aufbau aus Kohlenoxyd und Wasserstoff;" *Brennstoff-Chemie*, vol. 4 (1923), p. 193; and vol. 5 (1924), pp. 201 and 217.

[29] Elworthy, R. T., *Canadian Chem. Met.*, vol. 9 (1925), p. 139.

showed that the mileage per gallon of methanol was approximately half that obtained with gasoline. The addition of 5 per cent water to the methanol was necessary to prevent back-firing, and after the addition of the water satisfactory service was obtained with a compression ratio of 6 to 1.[29] There was no detonation. One disadvantage of methanol is its lack of miscibility with straight-run gasoline. Nevertheless, some blend can probably be worked out with a third component, and in view of the similarity in the method of manufacture to that of synthetic ammonia, methanol will doubtless receive serious consideration as a future motor fuel. At present it is of interest as a solvent in the chemical industries. As this process becomes developed in America, it will make coal our source of methanol instead of wood.

Of equal interest from the laboratory standpoint is the product obtained by Fischer and Tropsch[25] by a method similar to the methanol synthesis but by using a different catalyst. Instead of pure methanol they obtained a mixture of alcohols, aldehydes, ketones, and acids with aliphatic hydrocarbons containing up to 8 or 9 carbon atoms in the molecule. Synthol appears to be a better motor fuel than methanol, but the low yields—27 per cent as compared to 85 to 90 per cent for methanol—must be greatly increased before it can be considered as an equal possibility for motor fuel.



Parr Process Low-Temperature Coke

LABORATORY STUDY CONTINUES

However, the Kaiser Wilhelm Institut at Mülheim is continuing research in this field, and Fischer and Tropsch[30,32,33] have recently produced methane, gasoline and heavy oil from carbon monoxide and hydrogen at atmospheric pressure and a temperature of 520 deg. F. in the presence of finely divided metals such as iron and cobalt. Other research laboratories are now also working along these lines, so that further developments in synthesizing motor fuels may be expected in the future.

In the United States, the synthetic ammonia plant of Lazote, Inc., at Belle, W. Va., is now in operation. Its capacity is 25 tons of ammonia a day. Ammonia is made by the combination of gaseous nitrogen and hydrogen. The nitrogen is taken from the air and the hydrogen is made from water gas which in turn is made from the direct gasification of bituminous coal. Additional fuel is required for separating the nitrogen from the oxygen of the air and in compressing the gases to the high pressures (800 to 1,000 atmospheres) required for the process. Three to four tons of coal are consumed in the production of 1 ton of ammonia.

The estimated total synthetic ammonia production of the United States for 1926, of 32,000 tons will consume 32,000x3.3 or 105,600 tons of coal. This is an insignificant figure when compared to the total annual coal production of 500 million tons. The same will hold true for synthetic methanol production when it takes the place of wood distillation.

The sum total of these new developments in making chemical substances from coal has little influence on the total coal consumption. It is only through the substitution of synthetic fuels from coal for petroleum products that any material increase in coal consumption can take place, and this cannot happen while our petroleum supply meets the demand.

[29] Fischer, Franz, and Tropsch, Hans, "Methanol and Synthol aus Kohlenoxyds als Motorbetriebstoff;" *Brennstoff-Chemie*, vol. 6 (1925), pp. 233-234.

[30] Dumanois, Paul, "Value of Liquid Fuels in Internal-Combustion Engines;" *Compt. Rend.*, vol. 181 (1925), pp. 26-28.

[32] Fischer, Franz, and Tropsch, Hans, "The Synthesis of Petroleum at Atmospheric Pressures from Gasification Products of Coal;" *Brennstoff-Chemie*, vol. 7 (1926), pp. 97-104.

[33] Fischer, Franz, "The Synthesis of Petroleum;" Proc. International Coal Conference.

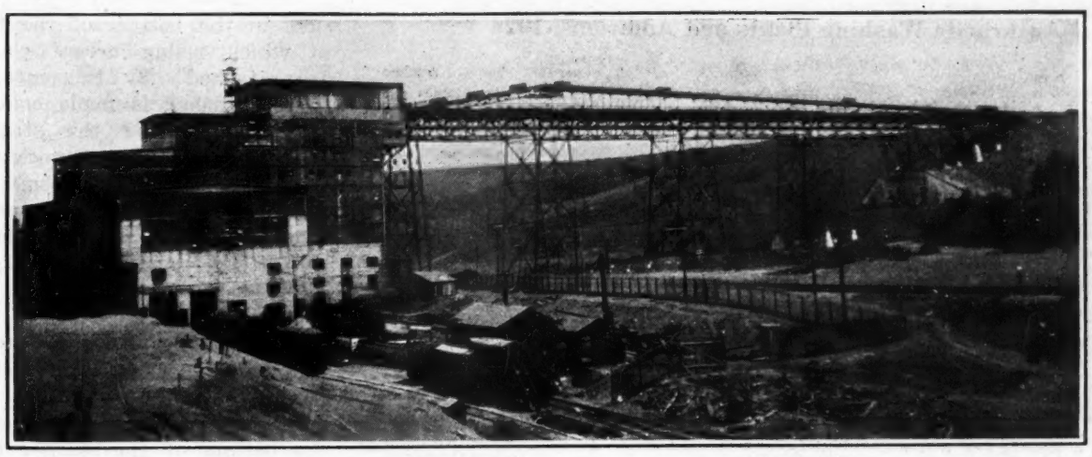
[34] Dumanois, Paul, "The Utilization of Methyl Alcohol as a Motor Fuel;" Proc. International Coal Conference.

[35] Nielsen, Harald, "Distillation of Coal;" "Internal Heating;" "'L & N' Process;" Proc. International Coal Conference.

Soft Coal Mined by Different Methods, by States, in 1925

State	Mined by Hand: Quantity (Net Tons)	Mined by Hand: Percentage	Shot off the Solid: Quantity (Net Tons)	Shot off the Solid: Percentage	Cut by Machines: Quantity (Net Tons)	Cut by Machines: Percentage	From Strip Pits: Quantity (Net Tons)	From Strip Pits: Percentage	Not Specified: Quantity (Net Tons)	Not Specified: Percentage	Total Production (Net Tons)
Alabama	2,432,110	12.1	6,559,783	32.8	10,594,391	53.0	403,682	2.0	14,429	0.1	20,004,395
Alaska	8,286	10.0	74,582	90.0	.....	....	.....	....	.....	....	82,868
Arkansas	8,958	0.7	472,814	38.8	537,295	44.0	199,092	16.3	1,880	0.2	1,220,039
Colorado	3,835,049	37.2	933,178	9.1	5,437,991	52.7	.....	....	104,333	1.0	10,310,551
Georgia	.....	....	6,600	10.0	.....	....	59,574	90.0	.....	....	66,174
Illinois	2,572,518	3.8	12,161,107	18.2	48,572,292	72.6	3,398,159	5.1	205,283	0.3	66,909,359
Indiana	391,726	1.8	4,577,590	21.6	12,925,739	60.9	3,269,386	15.4	60,525	0.3	21,224,966
Iowa	901,839	19.1	2,780,633	59.0	922,405	19.6	229	....	109,737	2 3	4,714,843
Kansas	232,147	5.1	2,811,530	62.2	198,099	4.4	1,123,950	24.8	158,525	3.5	4,524,251
Kentucky	1,139,048	2.1	3,950,584	7.1	48,553,752	88.2	1,375,744	2.5	49,542	0.1	55,068,670
Maryland	1,772,628	65.8	73,699	2.7	830,730	30.8	.....	....	17,515	0.7	2,694,572
Michigan	.....	....	24,488	3.0	783,745	97.0	.....	....	.....	....	808,233
Missouri	322,215	12.0	136,180	5.0	912,004	33.9	1,202,201	44.6	121,615	4.5	2,694,215
Montana	264,407	8.7	565,187	18.6	1,555,461	51.1	641,730	21.0	16,901	0.6	3,043,686
New Mexico	995,255	38.9	656,420	25.7	895,886	35.0	.....	....	9,290	0.4	2,556,851
North Carolina	47,685	73.2	16,468	25.3	1,000	1.5	.....	....	.....	....	65,153
North Dakota	9,614	0.7	259,837	19.6	440,477	33.3	506,393	38.2	108,299	8.2	1,324,620
Ohio	596,056	2.1	404,022	1.4	23,655,819	84.4	3,059,324	10.9	318,891	1.2	28,034,112
Oklahoma	34,244	1.5	554,924	23.9	1,326,976	57.0	395,496	17.0	14,200	0.6	2,325,840
Pennsylvania	43,720,883	31.9	4,593,373	3.4	86,973,404	63.5	800,615	0.6	839,744	0.6	136,928,019
South Dakota	.....	....	.....	....	.....	....	.....	....	14,447	100.0	14,447
Tennessee	781,852	14.3	2,109,114	38.7	2,553,838	46.8	.....	....	9,207	0.2	5,454,011
Texas	531,755	52.7	211,202	20.9	135,772	13.5	129,646	12.9	.....	....	1,008,375
Utah	528,935	11.3	*683,966	14.6	3,477,441	74.1	.....	....	.....	....	4,690,342
Virginia	319,611	2.5	2,006,309	15.7	10,472,410	81.8	.....	....	1,113	....	12,799,443
Washington	1,417,723	55.9	965,037	38.0	138,752	5.5	.....	....	16,378	0.6	2,537,890
West Virginia	17,471,370	14.3	3,821,151	3.1	100,786,542	82.4	272,082	0.2	29,814	....	122,380,959
Wyoming	794,612	12.1	1,676,618	25.6	4,043,537	61.7	33,579	0.5	4,886	0.1	6,553,232
Other States	7,500	59.4	5,100	40.4	.....	....	25	0.2	.....	....	12,625
Total	81,138,026	15.6	53,091,496	10.2	366,725,758	70.6	16,870,907	3.2	2,226,554	0.4	520,052,741

* Includes 604,310 tons reported by the companies as "pillar coal," the method of mining which, of course, differs materially from solid shooting in rooms or entries. Indeed, most of the coal reported as shot off the solid in Utah is probably "pillar coal." Compiled by U. S. Bureau of Mines.



Mechanical Cleaning Makes Rapid Strides In 1926

By Thomas Fraser
Mining Engineer, Pennsylvania Geological Survey, Harrisburg, Pa.

New applications of old principles advance cause of better preparation of coal in both anthracite and bituminous fields. Wet processes gain favor.

IN MECHANICAL CLEANING of coal the past calendar year was one of unprecedented activity both in the construction of new plants and in the introduction of new processes and devices for treating the raw coal. The wide interest in mechanical preparation which the bituminous field has shown is the more conspicuous because it is of comparatively recent development. The rapid turn from the former almost universal prejudice against the washery has been coincident with the introduction of loading machines in the mines and was necessitated largely by this development.

It is generally conceded, by both the users and makers of mechanical loaders, that these machines cannot be operated at maximum capacity without loading more dirt with the coal than is usually loaded when coal is put in the cars by hand. For this reason, those who operate loading machines must increase the preparation facilities in the surface plant, and in not a few cases introduction of mechanical loading hinges upon the discovery of a cheap and effective means of cleaning the coal.

In the anthracite field, activity in preparation is less conspicuous only because it is less unusual. The principal field of new activity in anthracite preparation is the treatment of small sizes (No. 2 buckwheat, barley and silt) and river coal. Much experimental work also is being done on briquetting, especially by processes involving admixture with a small percentage of coking bituminous coal which forms a coke binder upon carbonization in retorts.

The principal innovations in coal-cleaning equipment introduced during the year, or that made notable progress during the year, are:

(1) Hydrotator. (2) Rheolaveur. (3) Arms air concentrator. (4) Menzies' jig, or buckwheat separator, and (5) Chance sand-flotation process.

The Hydrotator, illustrated on page 130, is the most recently introduced device for cleaning coal. It is a cylindrical tank with a vertical hollow shaft in the center, which carries near the bottom four radial arms, also hollow. The shaft and arms are free to rotate, supported from an overhead bearing. Water is pumped in through the hollow shaft and issues from nozzles spaced along the radial arms. These nozzles are directed downward and backward so that the jets of water issuing from them have a propelling effect, causing the shaft and arms to rotate slowly.

How Tank Operates

In operation, the tank is filled with a pulp of fine coal and water, and coal, flowing in water, is fed continually through a central baffle ring. The jets of water issuing from the moving arms impinge upon the bottom of the tank and then rise through the pulp, producing a uniform rising current of water over the entire section of the tank which keeps the coal particles in continuous agitation. The lighter particles in the feed, constituting the clean coal, are carried up and over the discharge lip of the tank by the water and the heavy refuse collects at the bottom where it is drawn off.

The plant arrangement developed for the treatment of fine coal permits of a simple and low cost installation, as the plant is built up essentially of inexpensive wooden tanks, standard pipe fittings and centrifugal pumps.

This is primarily a fine-coal washer and is peculiarly adapted to the preparation of the small sizes of anthracite and the friable bituminous or coking coals, which, with this pocess, may be crushed to fine size so as to completely detach the dirt from the coal, permitting production of a very clean washed coal with a minimum of loss in the form of middlings, or boney. The Hydrotator may be used also as a flotation unit, and satisfactory performance is reported at experimental installations in the Alabama field.

When the operation is so adjusted as to carry practically nothing over the water-discharge lip, the machine becomes a thickener. In the machine designed for thickening service, the water pumped through the agitating nozzles is drawn from the upper part

The headpiece shows the new breaker and washery of the Butler colliery of the Pennsylvania Coal Co., under construction in 1926.

Anthracite Washing Plants and Additions, 1926

Name	Location	Capacity, Tons per Hr.	Type of Washer
Lansford	Lansford, Pa.	500–600	Jigs and tables
Butler	Near Pittston, Pa.	300	Jigs
Loomis	Near Nanticoke, Pa.	400	Rheolaveur
Lattimer	Near Haselton, Pa.	60–90	Rheolaveur
Baltimore	Wilkes-Barre, Pa.	100	Rheolaveur
Marvine	Scranton, Pa.	30	Rheolaveur
*Haselton Shaft	Haselton, Pa.	300	Rheolaveur
*Good Spring	Near Tremont, Pa.	25–30	Rheolaveur
Natalie	Near Mount Carmel, Pa.	500	Chance
Reppher Coal Co.	St. Clair, Pa.	250	Chance
Shamokin Coal Co.	Shamokin, Pa.	200	Chance
South Penn Collieries Co.	Port Carbon, Pa.	200	Chance
Coleraine Collieries Co.	Junedale, Pa.	150	Chance
J. E. Crass, Jr.	Moosic, Pa.	150	Chance
Winton Coal Co.	Winton, Pa.	150	Chance
John Ames Coal Co.	Wilkes-Barre, Pa.	150	Chance
Northumberland Mining Co.	Excelsior, Pa.	250	Chance
Clifford Coal Co.	Avoca, Pa.	150	Chance
*J. E. Crass, Jr.	Avoca, Pa.	150	Chance
*South Penn Collieries Co.	Scranton, Pa.	500	Chance
Middle Creek	Near Tremont, Pa.	30	Hydrotator
*Hillvue Coal Co.	Gordon, Pa.	30–40	Hydrotator
Philadelphia & Reading Coal & Iron Co.	Middle Creek, Tremont, Pa.	.....	Deister-Overstrom
Philadelphia & Reading Coal & Iron Co.	Bast Colliery, Ashland, Pa.	.....	Deister-Overstrom
Manbreck Coal & Ice Co.	Schuylkill Haven, Pa.	.....	Deister-Overstrom
Philadelphia & Reading Coal & Iron Co.	North Franklin, Shamokin, Pa.	.....	Deister-Overstrom
Drifted Coal & Supply Co.	Shoemakersville, Pa.	.....	Deister-Overstrom
Danbert Coal Co.	Schuylkill Haven, Pa.	.....	Deister-Overstrom
Pine Hill Coal Co.	Minersville, Pa.	.....	Deister-Overstrom
Locust Mountain Coal Co.	Shenandoah, Pa.	.....	Deister-Overstrom
Jeddo-Highland Coal Co.	Jeddo, Pa.	.....	Deister-Overstrom
Landingville Coal Co.	Landingville, Pa.	.....	Deister-Overstrom
Alliance Coal Mining Co.	Middleport, Pa.	.....	Deister-Overstrom
Glen Alden Coal Co. (additions)	Bliss, Nanticoke, Pa.	80–100	Elmore
Glen Alden Coal Co. (additions)	Truesdale, Wilkes-Barre, Pa.	320–400	Elmore
Glen Alden Coal Co. (additions)	Loomis, Nanticoke, Pa.	80–100	Elmore
Glen Alden Coal Co. (additions)	Woodward, Kingston, Pa.	40–50	Elmore
Shipman Coal Co.	Shamokin, Pa.	.....	James
Lehigh Valley Coal Co.	Spring Mountain, Jeanesville, Pa.	.....	James

of the tank itself, through a perforated ring that runs around the perimeter of the tank.

Water and fine solids drawn into the pump through this ring are discharged directly into the bottom of the tank. The bed of thickened heavier and coarser material in the lower part of the tank acts as a filter to retain the solids in the circulating water. This internal circulation, with constant return of the fines directly to the bottom of the tank, is said to build up the thickened charge more rapidly than it is done in the gravity-settling types of thickeners.

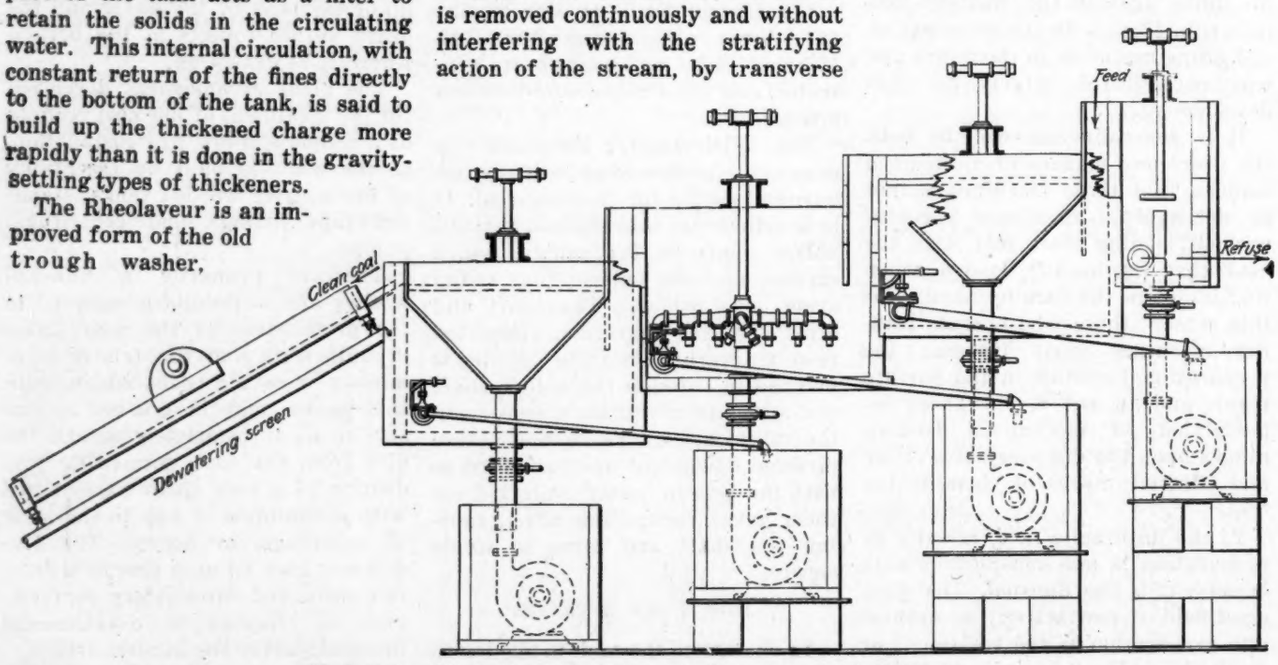
The Rheolaveur is an improved form of the old trough washer, at one time used, almost to the exclusion of other washing devices, in Great Britain and other parts of Europe. The trough washer, which is merely an inclined trough through which the coal is carried by a stream of water, is the oldest and simplest of coal-washing devices.

In the new Rheolaveur, the refuse is removed continuously and without interfering with the stratifying action of the stream, by transverse slots in the bottom of the trough, to which rising-current classifiers are attached. By this means the trough washer is made continuous in operation and the stratifying effect of the main stream flowing in the trough may be supplemented by a rising current in the slot and water column below it, through which the refuse is discharged.

Recirculation Aids

The separation is further facilitated by the practice of recirculating a certain proportion of the middling material so as to retain on the bottom of the washer troughs a moving blanket of middlings, between the pure coal and the slate, thus widening the zone of separation and decreasing the probability of pure-coal particles being entrapped and carried down into the trap by the refuse. The Rheolaveur has been extensively used in Europe for years, but its introduction into America is recent.

The use of pneumatic concentrating tables for cleaning coal is not a development of the past year, as this type of cleaner was introduced several years ago with the installation of Sutton, Steele and Steele's pneumatic tables in a plant of the McAlester Edwards Coal Co. at Pittsburg, Okla. At the end of 1925,



Hydrotator Plant Consists of Standard Parts and Wood Tanks

Each of the three upper tanks on the left has an agitator pipe like the central one but, as only the center tank is shown in section, all that appears of the tank on the extreme left and of the third tank from the left is the cape-like box on the side of the tank which collects about half the light coal effluent and conducts it to the tank below. There the centrifugal pump recirculates it through the agitator pipes. The upper tank on the extreme right receives only the coarser and heavier effluent from the tank to the left which itself is fed with the raw feed. The tank on the right is made small because as the coal handled is large in quantity and heavy a large tank with a sufficient rising current to float the middlings would demand a large pump. This tank has nothing but a straight pipe and a baffle. The light effluent from each tank goes in two ways. One-half goes to the next tank or to the dewatering screens, and one-half to the lower tank for recirculation.

eleven pneumatic-table plants with a combined daily capacity of 5,000 tons were in use or under construction in United States and Canada.

The Arms concentrator was introduced in the latter part of 1925 and installed in a number of cleaning plants during the past year. This machine differs from the older pneumatic tables principally in mechanical and structural details. The fan, which supplies air to the perforated table, is placed directly below the separator in such a position that the air may flow in a straight line, directly into the distributing chamber. The table deck and shaking parts are improved structurally, and the driving mechanism is of simpler and more rugged design than in the older type of table as originally introduced from the metallurgical field.

This separator consists of a shaking perforated deck on inclined supports that give the deck a slight rise on the forward stroke so as to move the coal forward on the table. A continuous current of air is blown upwardly through the perforated deck to stratify the layer of coal upon it. The deck is given a slight tilt to one side so that the coal, which is lifted by the air and the upward kick of the deck on the forward stroke, flows off over the side; heavy refuse hugs the surface and is conveyed by its shaking motion to the end of the deck where it is discharged separately.

For successful separation of coal from rock on a pneumatic table, the feed must be screemed into separate products of a comparatively narrow range of sizes. The Arms screen was developed to prepare the feed for Arms dry-cleaning tables. This screen differs from the vibrating screens, widely used for screening fine ores, sand, etc., in that the screening surface is horizontal or only slightly inclined so that the feed does not flow over it by gravity but is propelled over it at a uniform and controllable rate by the shaking motion. The screen frame is supported at the discharge end by inclined flexible hangers, and at the drive end it is attached directly to the eccentric straps. The discharge end therefore reciprocates in an inclined path and the drive end has a circular motion. It is driven at about 450 r.p.m. with a $\frac{3}{4}$ in. stroke. This rapid reciprocation keeps the screen cloth in vibration and propels the load forward over the screen.

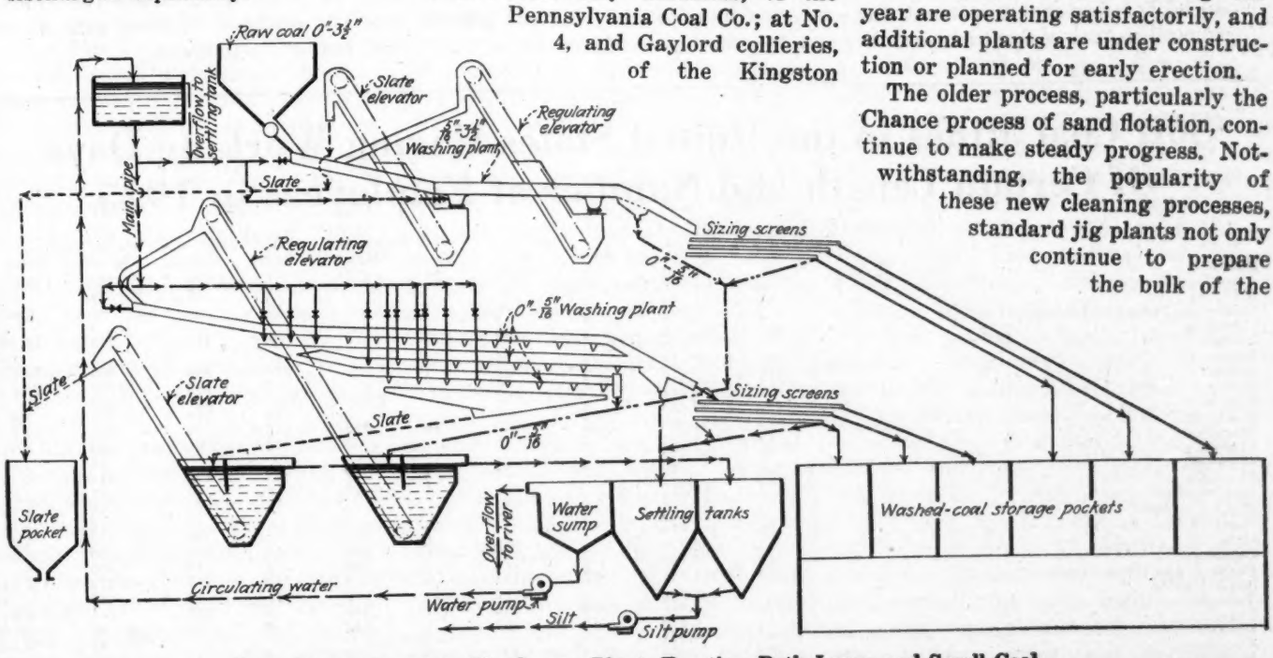
The Menzies' separator, designed primarily for buckwheat coal, is much like a small jig in construction, but the separation is effected in a continuous rising current of water. It operates therefore, as a rising-current classifier. A number of the separators have been installed during the past year in anthractie preparation plants. Installations have been made at No. 1, No. 9, Old Forge and Forest City Collieries, of the Pennsylvania Coal Co.; at No. 4, and Gaylord collieries, of the Kingston Coal Co.; at Ontario colliery, of the Scranton Coal Co., and at East Boston and Sandy Run collieries.

A review of developments in 1926 and recent preceding years reveals a growing trend toward mechanical as against hand preparation in bituminous as well as anthracite mines. Except in a few fields that presented unusual conditions, such as the Birmingham field, the introduction of bituminous coal-cleaning plants in America has been slow and fitful until about four years ago. In recent years, however, new mining methods, diminishing reserves of low-sulphur coal, high labor cost, and increasing discrimination on the part of buyers have favored the construction of cleaning plants.

In the anthracite field, the principal tendencies are: (1) Continuation of the change from the older types of dry breakers to wet preparation, and (2) the introduction of mechanical devices for preparing the small sizes—rice, barley and even silt—for market. In this field, dry systems of treatment are not generally sought because of the universal use of wet screening and because of the indifferent results obtainable with the mechanical slate pickers commonly used in early dry breakers.

For general anthracite preparation, the Rheolaveur is the outstanding innovation of the year. It now holds the center of new interest. Several plants started during the year are operating satisfactorily, and additional plants are under construction or planned for early erection.

The older process, particularly the Chance process of sand flotation, continue to make steady progress. Notwithstanding, the popularity of these new cleaning processes, standard jig plants not only continue to prepare the bulk of the



Flow Sheet, Complete Rheolaveur Plant, Treating Both Large and Small Coal

The upper left-hand portion shows the sealed-discharge washer, in which the refuse falls into a boot, the water in which stands at the level of the washing trough. It will be seen that only the first Rheobox is supplied with a rising water current. The lower washer is an open-discharge Rheolaveur, the discharge dropping through the air with, however, a regulated degree of choking at the orifice. It will be noted that some of the Rheoboxes are connected with the water supply. The others are not.

Bituminous Washing Plants and Additions, 1926

Name	Location	Capacity, Tons per Hr.	Type of Washer
American Smelting & Refining Co.	Cokedale, Colo.	50	Rheolaveur
Great Valley Anthracite Corp.	McCoy, Va.	125	Rheolaveur
East Broad Top Coal Co.	Union, Pa.	400	Chance
Berwind-White Coal Co.	Winber, Pa.	400	Arms air table
Algoma Coal and Coke Co.	Algoma, W. Va.	200	Arms air table
Brazeau Collieries, Ltd.	Nordegg, Alta.	150	Arms air table
Elk River Coal & Lumber Co.	Widen, W. Va.	160	Arms air table
Ayrshire Coal Co.	Oakland City, Ind.	100	Arms air table
Winding Gulf Collieries Co.	Winding Gulf, W. Va.	50	Arms air table
Winding Gulf Collieries Co.	Winding Gulf, W. Va.	25	Arms air table
Winding Gulf Collieries Co.	Winding Gulf, W. Va.	25	Arms air table
*Pittsburgh Coal Co.	Library, Pa.	325	American separator
International Coal & Coke Co.	Coleman, Alta.	150	American separator
*McGillivray Creek Coal Co.	Coleman, Alta.	150	American separator
American Coal Co. (Addition)	McComas, W. Va.	...	American separator
*Davis Coal & Coke Co.	Boswell, Pa.	...	Air tables
American Coal Co.	Widemouth, W. Va.	...	Jeffrey Robinson cone
American Coal Co.	Winona, W. Va.	...	Jeffrey Robinson cone
H. J. Patterson Coal Co.	Arista, W. Va.	30–40	Jigs
Southern Coal & Coke Co.	Boothton, Ala.	.....	Deister-Overstrom
Black Diamond Coal Co.	Johns, Ala.	.....	Deister-Overstrom
Black Diamond Coal Co.	Birmingham, Ala.	40–50	Elmore

*Under construction, started in 1926.

coal but are well represented in new construction.

In the bituminous field, dry preparation continues to hold the major attention, and more than half of all the new plants built or started during the year, are air-table plants. The many advantages of dry operation and dry coal presage a continuation of this trend. Here also, as in the anthracite field, the older processes have their following and wet treatment is preferred by many. In the Alabama field and in the Northwest particularly, general conditions favor wet treatment.

The Rheolaveur process has attracted much attention in the bituminous as well as the anthracite field as evidenced by wide discussion and actual plant construction.

The Hydrotator is now being introduced for fine-coal treatment and for metallurgical coal which may be crushed fine. For this service it has interesting possibilities because it is inherently a fine coal washer, free from the difficulties of low capacity, over-sensitiveness and incomplete separation characteristic of jigs and other coarse-coal concentrators when modified so as to adapt themselves to the cleaning of fine coal.

AIR-SAND PROCESS

Semi-commercial tests of a new process of dry-cleaning coal known as the Air-Sand process, were started during the year and will be actively prosecuted during 1927. This is a float-and-sink method of concentration, making use of a mass of dry sand, refuse or coal, fluidized by bubbling air uniformly up through it. The advantages claimed for it are: (1) Dry operation, (2) treatment of unsized coal, and (3) use of a very small quantity of air.

Specialization Progress In the Year 1926

During the past year coal operators and managers have given evidence of the acceptance of the idea that with consolidation of companies and growth in size of operations, specialization is possible and to be desired. Witness medicine since communities grew and enabled doctors and surgeons to pursue certain lines of inquiry and practice, rather than to enter the whole domain of medicine and surgery. Coal-mining engineers have for years regretted that so broad a field of activity was theirs, ranging over railroad, structural, chemical, geological, ventilational, house construction, mechanical and electrical engineering. Some of the more rash individuals prided themselves on the length and breadth of their fields, forgetting that what was gained in expansion was lost in intensity.

But during 1926 the change which has been operating went a few steps forward. Specialization brought new titles into the industry. Each man had a definite field of action on which he concentrated. The Union Pacific Coal Co. was a recent instance of such a movement, and the Consolidation Coal Co. was a conspicuous example during the past year. But the devolution of duties to separate individuals with a single function only, or a group of allied functions, was not confined to these companies but was quite general.

Soft Coal Mines in the United States Having Working Days Of Certain Length and Number of Employees in 1925

State	8 Hours		9 Hours		10 Hours		All Others*		Total	
	Mines	Men	Mines	Men	Mines	Men	Mines	Men	Mines	Men
Alabama	78	7,230	71	13,511	29	3,458	61	2,898	239	27,097
Alaska	6	140	...	.....	..	.....	3	17	9	157
Arkansas	81	3,274	1	50	4	261	10	53	96	3,638
California, Idaho and Oregon	4	38	1	4	..	.....	...	...	5	42
Colorado	155	†12,808	3	180	..	.....	71	215	229	13,203
Georgia	1	137	...	.....	..	.....	...	...	1	137
Illinois	371	77,132	1	5	..	.....	94	686	466	77,823
Indiana	177	22,588	2	28	..	.....	24	116	203	22,732
Iowa	154	9,946	...	.....	..	.....	53	221	207	10,167
Kansas	135	†7,088	1	8	..	.....	94	704	230	7,800
Kentucky	576	†51,682	32	4,389	16	798	17	155	641	57,024
Maryland	71	3,508	1	26	..	.....	16	46	88	3,580
Michigan	10	1,579	...	.....	..	.....	...	...	10	1,579
Missouri	100	4,480	5	124	1	17	48	493	154	5,114
Montana	32	2,541	...	.....	1	69	19	70	52	2,680
New Mexico	28	†3,272	...	.....	..	.....	10	172	38	3,444
North Carolina	2	140	...	.....	..	.....	...	...	2	140
North Dakota	56	870	...	.....	7	136	89	301	152	1,307
Ohio	462	38,225	9	290	7	393	161	750	639	39,658
Oklahoma	90	5,198	4	272	3	146	3	15	100	5,631
Pennsylvania (bituminous)	1,759	†151,764	67	4,103	6	114	142	817	1,974	156,798
South Dakota	...	.....	...	.....	..	.....	17	49	17	49
Tennessee	102	7,417	2	262	1	248	6	387	111	8,314
Texas	15	839	13	501	1	222	8	546	37	2,108
Utah	41	4,441	...	.....	..	.....	...	...	41	4,441
Virginia	106	13,431	4	225	1	10	2	11	113	13,677
Washington	52	3,704	...	.....	..	.....	4	22	56	3,726
West Virginia	1,088	†102,134	51	7,485	13	423	21	147	1,173	110,189
Wyoming	55	6,216	1	2	..	.....	5	20	61	6,238
Total	5,807	541,822	269	31,465	90	6,295	978	8,911	7,144	588,493

* Includes employees in mines where the established working day was changed during year, or where the working day was irregular, or which failed to answer the inquiry.

† Includes outside employees working 9 or 10 hours a day at certain mines where the established time for underground workers is 8 hours.

Compiled by U. S. Bureau of Mines.

Year's Indications Predict Mine Mechanization Will Force Radical Change in Management Technique

Mechanization will force planned schedules for production and cost control. Human relations work of corporations will be adequate to care for social welfare of personnel. The coal industry has indicated a definite desire for scientific management.

By J. M. Carmody
Consulting Management Engineer
New York City

CHANGING conditions demand a change in methods. The development of markets, the demands on production and shifting economic conditions place upon management the burden to carry on. Upon the managing executive has fallen the burden for co-ordinating for more effective utilization, under all changing business and economic conditions, the studies and efforts of many individual specialists.

A Human Problem

The increasing use of machinery in mining introduces not alone a mechanical problem, but is further complicated by the increasing complexity of the problems of organization of specialists—really a human problem. For many years the only divisions of functionalization coal company management recognized were those natural ones such as engineering, legal, accounting and operating. More recently further branching out has been noticed, such as inspection, safety, welfare, real estate and combustion engineering within the sales department. With one or two exceptions these might be classed as functions of the administrative or executive department.

Just now there is a tendency to go still further until it has affected the operating departments. When the idea of functionalizing separate activities under specialists was first given to the manufacturing industries it was attacked as creating too many bosses, and in some cases it seemed artificial because it was installed as a "system" instead of a gradual growth in recognition of increasingly complex operating conditions.

Within the operating departments of the coal industry this growth has been steady and has been the result of management changing its method to meet new operating conditions. Today we see the electrical department in charge of locomotives, wiring, bonding, installations and maintenance. Several companies have created power departments to take care of generation, transmission and distribution. In some cases such departments operate on a budget or a yearly appropriation of their own and are not affected in direct proportion to production.

The directors recognize the fact that equipment and plant must be maintained in good operating condition even in periods of depression, to preserve the value of the investment. We see separately maintained inspection and safety departments, central employment bureaus and industrial relations departments, all of them being adopted as a result of a natural growth. More and more the mine foremen and mine superintendents are becoming "strictly production" men, being relieved little by little of many details of purchasing, hiring and caring for labor, maintaining equipment, supplies and machinery, planning, developing, etc.

Makes for Efficiency

The result of this has been that the mine foremen and superintendents are no longer the combinations of electrical, mining, mechanical, maintenance and production men they once were. The increasing use of the functional idea in management has given to the supporting departments the responsibility of planning for production and to the foremen and superintendents the duty of producing. Relieved of numerous details they can concentrate entirely upon more effective production.

Many of the management tools which other successful industries have developed and used to their advantage are either being developed and introduced or are being investigated by the coal-mining industry today. Mass production and increased specialization due to the division of labor brought into all industries the personnel or human problem. The coal industry is not lagging in its efforts to solve this problem. The Lehigh Coal & Navigation Co. has its personnel department, the United States Coal & Coke Co. is solicitous for the human welfare of its employees in its many communities, the Davis Coal & Coke Co. maintains an industrial relations department as does the Consolidation Coal Co., the Phelps-Dodge Corporation, the Union Pacific Coal Co., and the Lehigh Coal & Navigation Co., as well as many others, have foreman training courses. The Bethlehem Mines Corporation and some of the large anthracite companies conduct training courses for their future executives.

Group Insurance Grows

Group life insurance has continued as an important industrial relations policy of coal mining companies. Entering this industry about twelve years ago it has made steady progress until at the beginning of 1926 some ninety coal mining companies held policies covering over 30,000 employees. Twenty-eight companies purchased group life insurance protection for more than 6,000 employees during 1926.

Scientific management has been an important factor in the orderly development of other industries for many years. Last year at the Coal Mining Institute of America the application of scientific management to the coal mining industry was discussed. Engineers and others within the industry are today asking for better management methods to eliminate waste due to idleness of men and equipment, more effective methods to encourage and increase mechanical loading. After all, they are but asking for the introduction of analytical methods into management, the same detailed and analytical study that the engineer gives to his mathematical problems. He breaks his problem into its component parts for investigation. Detailed analyses are the microscopes of methods of operations.

During the past year the Valier Coal Co., in Illinois, perfected a dispatching system for its haulage and installed automatic signals or control for trips at the bottom of its shaft to prevent congestion. Aside from this company, many others are using and installing telephone control not only for dispatching haulage but to control all operations. Because it breaks down the barriers of distances the use of the telephone underground is increasing. An experiment in scientific management in which all divisions of production were controlled was made during the year. Conducted only as an experiment, production control which stressed the control of the source of production, the miner at his working place, indicated the possibilities there are in scientific management.

BUDGETS ARE DEVELOPED

The Pittsburgh Coal Co., the Keystone Coal & Coke Co., the Southern Coal & Coke Corporation, and others are developing the use of the budget to control expenditures against an expected income. Budgeting so far has been used only by the administrative or executive departments and the coal industry brought forward all the objections against budgetary control that the other industries overcame some years ago, "our business is different." The tendency is to budget operating costs carefully, based on intelligent analyses of conditions.

As shown by some developments in management last year, and as indicated by the present problems of mechanical production, management in the coal mining industry is beginning to see that the fundamentals of good management are the same for all industries; the principles do not change though the details may. By the recognition of this truth the coal industry will be able to take advantage of and put into practical use the researches and discoveries that other industries have made in management.

In the elimination of waste, time study of operations is going to play an important part. Performance checked against a known time is going to be the basis of operations control. Here and there throughout the industry over a period of years the operating officials knew how long it should require a locomotive crew to place and deliver a trip of cars and the time required for caging and hoisting. They now recognize the necessity of additional detailed information.

J. M. Carmody

Born under the shadow of Barclay Mountain, John Carmody received his first impressions of the coal industry from his relatives and neighbors in Bradford County, Pennsylvania. Later he began to glimpse the opportunities of management in the steel industry. The next step was association with Harrington Emerson and the study of management engineering as a profession. Mr. Carmody was a member of the staff of the U. S. Coal Commission and later served as vice-president in charge of industrial relations for the Davis Coal & Coke Co.

TIME STUDIES MADE

During the latter part of 1925 and through 1926 one large company had an extensive program of time studies. The object was to gather and record basic facts regarding elementary operations and times required to perform them. As indicated by the time studies of another company in Pennsylvania on cutting machine and mechanical loading operations, detailed time studies as a method to increase effectiveness are gradually replacing the old methods of general observation. This detailed method of studying operations is used by the mechanical and electrical engineers to find mechanical and power wastes, as for instance the detailed operating tests of the Chicago, Wilmington & Franklin Coal Co. to determine the relative merits of high- or low-speed gathering locomotives; it is but a short step to apply these methods to coal mine operation.

Several companies recognized this function during the year to time and schedule their haulage.

The demand for the maintenance of the present wage scale for the union fields, the increase in mechanization within these fields to combat lower wage competition, local conditions within certain non-union fields tend to level the influence of the wage factor in operating costs. Changing, spotty, and irregular selling prices with low and often nonexistent margins of profit; threatened competition of hydro-electric and oil as a source of power are conditions that must be met by management. These are the conditions that are going to give an impetus to the study of management as the coordinating function for the greater effectiveness of the engineering, sales, accounting and financing departments.

SEEKING BETTER MANAGEMENT

Progress that has already been made in this and in other leading industries indicates that probably one or more of the following courses will be pursued this year looking toward improvement of operating management technique. Some companies, working independently, will either engage management engineers to study their operating problems along scientific lines or assign from their own staff one or more individuals, free from routine duties, to devote full time to these detailed studies. Other companies, working together, may engage competent management counsel, co-operate in pooling experience and share costs.

Still another approach may be through the National Coal Association, American Mining Congress, or the American Institute of Mining and Metallurgical Engineers. Under such a plan intelligent leaders of the industry will form a management committee. With ample financial and moral support such a committee, guided by experienced management engineers, will undoubtedly gather for the industry and pass on to it a body of authoritative data bearing on management problems peculiar to coal mining that will mark a new milestone.

This much-harassed industry has already made great strides. It will go on making them. Recognition of the fact that management in these complex times has become a profession requiring special fitness and training will go a long way toward putting coal mine management on a sounder basis. For such an effort, undertaken with sincerity and intelligence there is already ample reason to believe that management will have the co-operation of the mine employees, without which little progress can be made under any type of management.

Electrification Makes Most Striking Progress In Loading Systems and Power Plants

By Graham Bright
Consulting Engineer, Pittsburgh, Pa.

Wise use of electricity enables some operators to reduce production costs 30 to 40c. per ton. Central stations increase mine service in 1926.

WHAT MIGHT BE considered the most striking progress made in electrification of mine plants during 1926 has been along the lines of real commercial installations and operation of electrically equipped coal-loading systems. In quite a few cases the experimental stage has been passed and an actual saving of 30 to 40c. per ton has been effected.

The introduction on a commercial scale of loaders and conveyors in coal mines has brought out a rather startling fact that should have been anticipated. This fact is that the voltage regulation obtained in the average mine is not at all suited for the economical operation of loading machines and conveyors.

Voltage Important

The usual voltage regulation does not appreciably reduce the speed of gathering locomotives as the trolley-type of gathering locomotive is entirely too high speed to begin with. This is evidenced by the fact that a storage battery locomotive built for 3.5 miles per hour will gather as many cars in a shift as a trolley-type locomotive built for 5 to 6 miles per hour. With the trolley locomotive full speed is seldom attained in gathering service and a large part of the operation is on resistance points of the controller. Where low voltage or bad regulation is obtained these resistance losses are simply transferred from the resistance grids of the locomotive to the trolley and track return.

Low Voltage Low Output

Low voltage on cutting machines has been put up with so long that the results that could be obtained by real good voltage were hardly realized until the recent application of storage batteries to cutting indicated what could be expected if good voltage was maintained at the machine at all times. The slowing up of a loader, conveyor or cutter due to low voltage is a very serious matter and results in not only a decided reduction in production, a pronounced increase in electrical repairs due to burn-outs, but also has a slowing-up tendency on the entire personnel of the mine.

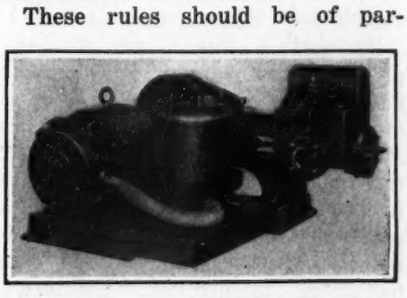
The usual method of a spasmodic checking-up of the bonding and adding a little feeder copper is too much of a cut-and-dried method to produce satisfactory and economical results. The solution of this very important problem is to apply real engineering to the entire power system of the mine.

Code Now Ready

During the past year the American Engineering Standards Committee has approved and passed as an American Standard a set of rules and regulations for underground power transmission and the installation of power equipment in coal mines. These rules represent the work of a number of committees over several years, and should mean a great deal to the coal mining industry since, if they are followed intelligently, safe and economical installations will result.

These rules should be of particular value to the mining departments of the various states interested in coal mining and can be used as a guide in formulating state laws pertaining to electrical equipment in coal mines. With these rules as a basis there should be a tendency toward uniformity in any other new laws being enacted.

There has been no radical change in locomotive design and construction during the past year. The magnetic and semi-magnetic control seems to be gaining ground and more of this type of control is being placed in operation every year. The magnetic control requires a fair voltage regulation and when trouble occurs with this type of control it is often a blessing in disguise in that it compels the operator to improve a bad condition in his trolley or track return.



Permissible Pumping Unit Increases Mine Safety

Combined on one bed-plate, this pumping machine consists of a permissible motor and controller suitable for service in mines which may become dangerous from gas.

Storage Batteries Gain

A number of new storage battery installations have been placed in operation during 1926. These installations consist of battery trucks equipped with lead-type batteries of over 100 kw.-hr. capacity and are largely used to operate cutting machines. The battery gives a good voltage at all times at the cutting machine, and has resulted in more places cut and a cooler motor at the end of the shift than when cutting from the usual wire circuit. If the batteries are charged at the proper time, the load factor is greatly improved and the cost of power reduced.

Safety Is Worth While

The cost of cutting when using battery power will be from 3 to 4c. more per ton than with trolley power, but the safety obtained with battery cutting is worth considerably more than this increase.

It can be safely predicted that for gaseous mines the use of batteries for gathering, cutting and pumping will have an increasing application.

The super-synchronous motor and the synchronous motor with internal magnetic clutch have seen wide application during the past year, but

mostly in metal mining and milling. There are many applications around coal mines, such as fans, large pumps, tipple and breaker machinery, where the synchronous motor with high starting torque might be applied.

The new type of double bar winding or squirrel-cage induction motor has found wide application on tipple machinery where fairly high torque is required for starting. This type of motor is being substituted for the wound rotor motor at a fairly large saving in both motor and control. The control is particularly simple and is well adapted for remote operation.

ELECTRIC SHOVELS INCREASE

There have been a number of electric shovel installations during the past year—chiefly at metal mines. The Bucyrus Co. has during the year installed a very large direct-current shovel in western Kentucky. This shovel is equipped with a synchronous motor generator set and the electrical equipment was furnished by the General Electric Co.

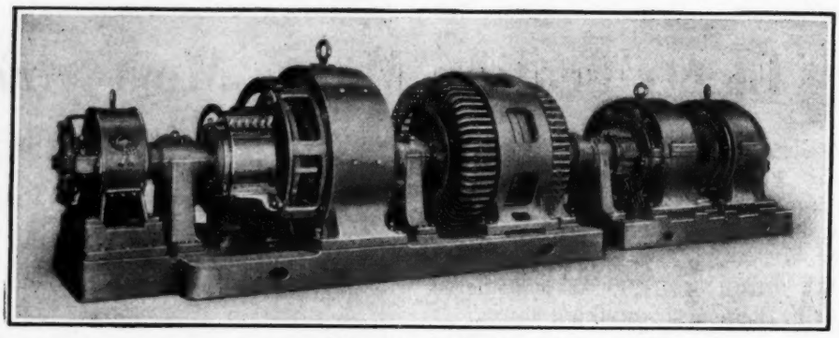
There has been a notable improvement during the past year in the amount of light given out by the individual cap lamp. A number of installations have been put in with lamps giving over twice the light that has been previously available. This is certainly a step in the right direction as increased illumination will without doubt increase both the efficiency and safety of mining.

MORE APPROVED EQUIPMENT

The U. S. Bureau of Mines has been very busy during the past year in connection with permissible equipment. Up to the present time the following is a list of the types and numbers of permissible plates issued:

Air compressors, 2; loading machines, 4; coal drills, 3; mining machines, 15; power hoists, 1; mine pumps, 2; fused switch, 1; electric cap lamps, 7; flame safety lamps, 7; methane indicator, 1; methane detector, 1; hand and trip lamps, 2; flash lamps, 1; single-shot blasting units, 7; gathering locomotives, 12; haulage locomotives, 1; oxygen breathing apparatus, 4; gas masks, 4; rock-dusting machines, 2; power trucks, 2.

The work of the U. S. Bureau of Mines in regard to permissible equipment for mines is showing a very healthy growth and should have every encouragement from all who are interested in real safety in mines. This work is of particular value to the various state mining departments and the coal operators in gaseous districts and unless the Bureau receives the hearty support and co-operation from such bodies the work will naturally cease, to the great detriment of the industry.



Power for Shovels

It has been generally agreed that large electric shovels are best operated when equipped with direct-current motors each supplied from a separate generator, as illustrated in this view of a motor-generator set. This set consists of a synchronous motor, three generators and an exciter.

UNIFORMITY DESIRABLE

The Bureau has a staff of high-grade and experienced engineers working constantly on mine safety problems and this work could not well be so done by any other organization in this country. The findings and recommendations of the Bureau in regard to safety and permissible equipment are in no way mandatory and could only be made so through the various state legislatures passing laws embodying these recommendations. If this were done, the laws of the various states would be uniform and there would be little or no conflict between the laws of neighboring states.

Automatic control for mine substations has been improved and simplified during the past year, and with the equipment available at this time there is no longer any excuse for a substation operator. Substation buildings and equipment are so well standardized that it is a comparatively simple matter to locate and install a new station when needed.

The central station companies supplying power to coal mining districts have spent considerable time and money during the past year in strengthening and rebuilding their transmission lines so that they are in better shape than ever from a continuity of power supply standpoint. The central stations also have been building larger plants, installing larger units, and discontinuing the smaller and less economical plants. A number of consolidations of power companies have been accomplished and a number of tie connections between large systems have been made. Serious trouble at any particular plant will no longer cause long shutdowns since power can be drawn from distant plants until the trouble has been remedied. There have been a number of instances during the past year where these tie connections have proved very valuable.

LOWER POWER RATES NEEDED

Even with the improvements in power supply, the coal operators feel that there should be a reduction in power rates from those established during the war. Since the war there has been a considerable reduction in the price of coal and some reduction in labor, so that it would seem that there should be some reduction in power rates. This feeling among the operators is shown by the interest toward the building of isolated plants, especially where there is fair water and a non-merchantable fuel is available. Such cases should be given careful consideration before a final decision is made.

EXPLOSION SAFEGUARDS

The future tendency of coal mining practice is leaning toward more mechanical and electrical equipment, better care in installation and upkeep, better safety precautions, better supervision, more concentration, better preparation and better selling. It is believed that if a mine is equipped with ample ventilation, rock-dusted at sufficient intervals, and permissible equipment used where necessary, that all is done that can be to make the mine safe and there is little likelihood of a serious explosion taking place.

It is only by following out the above procedure that costs can be reduced and a mine operated at a real profit.

What Railroads Did to Make 1926 a Record Year

By R. H. Aishton
President, American Railway Association

BOTH THE PUBLIC and the railroads can well be proud of the performance of the rail carriers during the past year. By furnishing the shippers of this country with adequate and dependable transportation, the railroads have contributed substantially to placing business of this country on a stable basis. This performance of the railroads has obviated the necessity for various industries maintaining large stocks in advance of actual requirements in anticipation of possible car shortage and congestion which formerly was looked upon as unavoidable at certain seasons of the year.

The railroads in 1926 handled the heaviest freight traffic they have ever been called upon to move. This was done without serious car shortage or other transportation difficulties. This heavy movement of freight started early in the year and gradually gained momentum until late this fall. In the face of this intensive wear and tear on equipment due to the heavy freight traffic, the railroads this fall, however, found both their cars and locomotives in better physical condition than at any time in recent years.

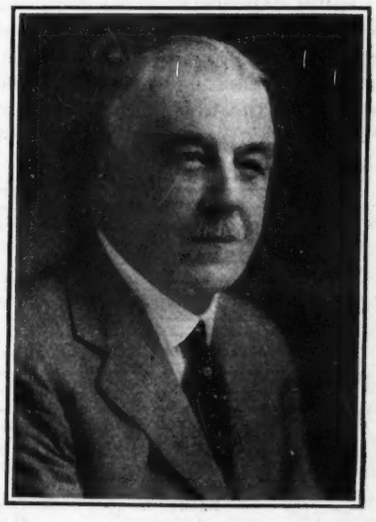
Traffic Breaks Record

Loading of all revenue freight in 1926 approximated 53,260,000 cars or an increase of 2,082,000 cars or 4 per cent over 1925, which marked the previous high record. While there has been a particularly heavy movement of all commodities in 1926, the demands upon the railroads for facilities to meet the extremely heavy movement of coal has equalled, if not exceeded, all previous years. This was particularly true of the coal traffic last fall when, from Oct. 2 to Nov. 20, bituminous coal loadings at mines were greater than during any similar period, exceeding by approximately 6,500,000 tons the next highest record made in 1920. This also was an increase of 8,182,000 tons over the corresponding period last year. The peak in coal production was reached the week of Dec. 4 when 14,676,000 tons of bituminous coal were produced. This was the fourth consecutive week in 1926 that the record week of 13,344,000 tons, which has stood since the fall of 1919, was broken. The 1919 record was again exceeded the week of Dec. 11.

Adequate transportation greatly aided all phases of industry. Heaviest freight traffic in history handled in 1926. Anticipate continuation of heavy loading of coal during first part of 1927.

Notwithstanding the extremely high rate of bituminous coal produced with the resulting heavy coal traffic last fall, the car supply continued to be adequate for requirements. There was an entire absence of car shortage except in isolated instances—and then only of a temporary nature. In fact, such car shortages as occurred as a whole were never more than 2 per cent of the requirements and more frequently were very much less. This means that the car supply at all times was well within 95 per cent of the requirements which, for all practical purposes, is the equivalent of a full car supply.

This performance on the part of the railroads in furnishing adequate transportation to the coal industry is all the more remarkable when consideration is given to the fact that the loading of other commodities requiring the use of open-top cars was greatly in excess of any previous period, exceeding the performance in 1925 by 682,134 cars or more than 9 per cent and that there was very little, if any, actual interference with other lines of industry to take care of the fall production.

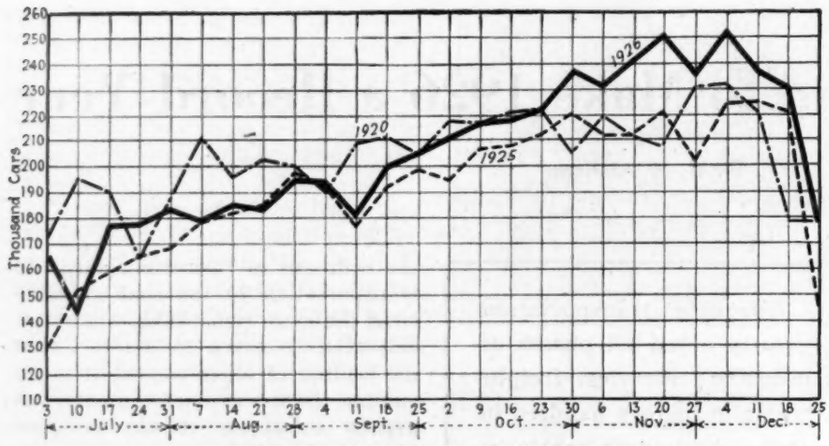


R. H. Aishton

These results as to the movement of coal were made possible through the carrying out of car service rules based on ownership principles by the railroads generally in co-operation with the Car Service Division of the American Railway Association. The return of owners' cars via the same junction by which cars left their home lines provides an automatic and economic method of distribution, far superior to any emergency or other orders that might be issued by any central authority. The strike of English miners produced a very stimulating effect on the exportation and production of American coal, 15,079,976 tons having been exported for the period from Jan. 1 to Oct. 30, an increase of approximately 235 per cent compared with the same period in 1925.

A Smooth Machine

This record movement of not only coal but other commodities in 1926 was carried on smoothly by the railroads. Outstanding embargoes remained at a minimum throughout the season with isolated situations here and there where necessity existed for the control of movement to individuals or industries. No embargoes were issued because of transportation disability on the part of the railroads. Certain roads in connection with the movement of coal to tidewater for export purposes did find it necessary to issue limited embargoes which were modified from time to time as conditions permitted. These embargoes were not caused, however, by the inability of any railroad to haul or dump coal but by the increased demand for export movement and delay in load-



A Rising Tide of Weekly Car Loadings

Weekly loadings of coal after the second week in July, 1926, showed a steady rise, culminating in a record week of Dec. 4 when 251,626 cars were loaded.

ing ships owing to the nature of the boats offered for foreign movement.

While the railroads do not anticipate a continuation of the extremely heavy movement of coal that took place in the fall of 1926, they are looking forward to a more or less heavy loading of coal, that is, compared with the corresponding periods in previous years, for the first few months in 1927. What will take place thereafter will, of course, be contingent upon business conditions and the general economic situation.

CAPITAL OUTLAY HEAVY

The ability of the railroads to bring about the remarkable performance that characterized 1926 was due largely to the enormous capital expenditures which the carriers have made for improvements since 1920. These expenditures total approximately $5,196,000,000, of which approximately $875,000,000 was actually expended for capital improvements during the past year. These expenditures were made in order to provide more adequate transportation service and to increase the economy and safety of operation. That the objective has been attained is attested by the performance of the railroads, particularly during 1926.

The amount expended for such improvements in 1926 was an increase of approximately $100,000,000 over 1925. Rail managements during the first nine months last year authorized capital expenditures totaling $1,175,000,000, which included $475,000,000 in unexpended authorizations brought over from 1925.

For equipment alone, the railroads for the first nine months in 1926 expended $271,023,000, an increase of $5,130,000 over the corresponding period in 1925. For locomotives, expenditures amounted to $72,324,000, an increase of approximately $30,000,000 over the same period last year. For freight cars, $143,265,000 was expended, a decrease of $31,107,000 under the year before while for passenger train cars, $43,403,000 was spent compared with $29,645,000 the year before. There was also an increase of $2,500,000 in 1926 over 1925 in expenditures for other equipment.

> **The secret of the railroads' ability to handle an unusual volume of traffic without any major interruption to transportation service is to be found in the large capital expenditures for improvements and additions made since 1920. Industrial preparedness is impossible without continuous modernization.**

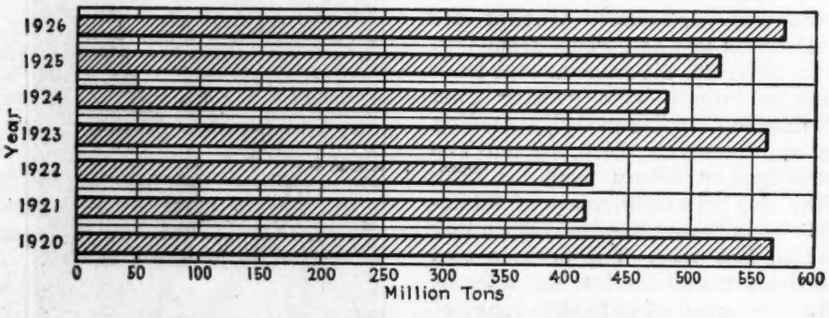
Capital expenditures for roadway and structures in the same period amounted to $358,070,000, an increase of nearly $79,000,000 compared with the first nine months of 1925. Of this amount, $124,084,000 went for additional track, an increase of nearly $25,000,000 over 1925, while $29,531,000 went for heavier rails, an increase of $4,500,000. For additional ballast, $12,059,000 was expended—$4,000,000 more than was spent for that purpose in the preceding year. For shops and engine houses, including machinery and tools, capital expenditures amounted to $29,115,000, compared with $22,676,000 in 1925. All other expenditures amounted to $163,281,000, compared with $123,878,000 during the first nine months of 1925.

CO-OPERATION GROWING

In addition to the large capital expenditures which have been made, the performance of the railroads in 1926 has also been due to the wonderful co-operation received from shippers, both individually and collectively, through their organizations and through various Shippers' Regional Advisory Boards that have now been set up in all parts of the United States.

The steam railroads have passed through two broad psychological phases in the public attitude of mind toward them and they are now on their way in a third. Briefly, the railroads and the relationship of the public toward them have passed through the early phase of *generosity* to the following phase of *animosity* and are now on their latest phase of *reciprocity*.

Transportation problems will always exist. Some of them will be grave and difficult, but all of them can be satisfactorily solved if the railways continue to work effectively with each other and with the public towards a satisfactory solution on a purely economic basis and with a recognition of a common interest. This constitutes the era of reciprocity. The beneficial effects are such as to lead to the hope that this last phase may be the permanent one on which the future of all may rest.



Bituminous Production Breaks Post-War Records

Bituminous coal production during the calendar year of 1926 was the largest since 1918. This tonnage was handled by the railroads with unusual dispatch.

Self-Regulation of Bituminous Coal Industry To Curb Evils of Overdevelopment Rising National Demand

By James J. Davis
Secretary of Labor

Controlled production points way to financial stability and labor contentment. Unless the industry itself assumes this responsibility, outside interference will be invoked by a harassed and disgruntled coal consuming public.

IN THE SIX YEARS that I have been Secretary of Labor the story of coal has come to me from operator, manager and financial man. In hearing the case of the workers engaged in all our principal industries, I have naturally gained some insight into the attitude of the miner of coal. All in all, my post in the government has provided me with a perspective that clears the vision of many clouds that previously obscured it. This perspective is further broadened by the service of statisticians and the advice of experts which we in the government enjoy.

Recently in addressing the American Mining Congress I sought to outline my ideas of the industry and its ups and downs. Let me restate some of these views:

Decries Toleration of Evils

"At the outset the industry tolerates technical evils that should not exist. Why should American mining be three times as dangerous to life and limb, as regards the number of men employed, as in the mines of England, Belgium, or France? What right has the present mining generation to waste the patrimony of the future by leaving 40 per cent of the coal in the ground and extracting only 60 per cent of the available supply, as the result of crudeness in method? In producing the more than 500,000,000 tons of bituminous coal in this calendar year of 1926, we shall leave approximately 400,000,000 tons more in pillars, stumps, thin and not immediately profitable coal, with losses by creeps and squeezes — meaning 1,000,000,000 tons less in our available coal supply."

But this is not the only wastage. "So long as the industry operates with mines, men, and equipment equal to an annual production of 350,000,000 tons more coal than we can consume, it will go on being faced by the most serious economic situation in American history. As long as this over-development continues, mining will go on being cursed with part-time employment and the discontent it breeds. The struggle to sell will become more severe. The operator will meet disaster. The poorly employed miner will be in a constant mood to strike. The public will be under the constant threat of strike. Industry as a whole will be thrown into confusion because of uncertainty in its coal supply. All this because of inability within the mining industry to put itself in business shape."

I realize that soft coal mining presents a most difficult economic problem. The purpose of each operator is the single one of mining and marketing coal. This must be done under conditions often diverse. Naturally the parties engaged must be in sharp competition, and this competition as naturally brings differences of view and interest.

Mining Never Free of Strife

But the more these differences are studied, the more clear it becomes that mining can never be free of strife and contest with not only the workers engaged in the industry but among the operators who want their due place in the market. If strife is to disappear from the industry, the very first requisite is for all interests engaged to get together and adjust these many differences, no matter how serious and difficult they seem.

Many bituminous operators have told me of many times selling their steam grades of coal at little more than cost, and sometimes at actual cost or even below. They have yielded to this losing scheme of production in order to keep their operations going or to meet disastrous competition in the same market or from other operators in neighboring and even distant fields. The American point of view would seem to be that *coal which cannot be taken from the mines at a reasonable profit and with reasonable employment and wages to the workers necessary to mine it should be left in the ground for future use.*

Anxiety to get business and keep operations going just enough days in the week as will hold miners at hand, while awaiting the demands of the brisk season, seems to me a policy that is economically unsound, whether viewed from the standpoint of the investor and operator, the miner, the industry, or the country in general. Neither the users of commercial, transportation or household coal expect or desire to buy coal mined at a loss to producer and miner both.

Defines Government's Stand

The statute books of our land contain no law that has for its object the ruin of any legitimate business. No branch of our government desires or advocates the conduct of any business along unprofitable lines. The government wants all business to be so administered as to render just returns to its owners and to its workers. The government does, however, seek to have industry so conducted as to safeguard the lives and limbs of workers, to protect the rights of management and workers, and to aid in every possible way the conservation of mineral resources by elimination of wasteful production.

Above all, the government does look to those in direct operation of any enterprise to do their part in solving the economic problems arising within it.

"The public itself best understands the evils of government control. The public no more wants it than businessmen do. The country expects the mining industry to put its own

house in order. It looks to mining to prove that it knows its own business. Until the industry does this, it will continue to be harassed by ills. It will go on lacking public confidence. It will be subject to depressions, hurtful competition, strikes, unusual labor turn-over, and unprofitable operation."

A great iron master once said of the steel business: "It is either prince or pauper." This can no longer apply to that industry. But does it not still apply to the soft coal industry, particularly to the commercial mines? Of course it does not apply to the many mines owned by manufacturing concerns, which are kept busy supplying their own needs.

After I had addressed the Mining Congress, a prominent operator put the following questions to me: "Should not the union coal operator realize that the union coal miner is his colleague?" Should he not encourage the miner to join in a common cause?" I answered that, of course, the operator and miner are associates and that both should cooperate to make the mining business a success. Personally I have always given my best effort to make successful the business of any one for whom I worked, and I believe nearly every worker is imbued with the same idea, especially when he knows that his employer in turn is interested in his welfare and seeks his co-operation.

JOINT COMPACT CONSIDERED

This operator further asked: "Would it not be better for all miners to work under a joint agreement similar to that of the glass industry, where the wage rate is dependent upon conditions such as the selling price, etc?" I answer that in my position I am not an advocate of any particular plan, but no matter in what industry men are working they should work in co-operation with their employers in order to produce to the profit of the employer and permit him to provide his employees with steady employment and a wage that will enable them to maintain the American standard.

I said I was in favor of any plan or program that will render prosperous both the producers and the miners of coal. I am for whatever plan can be devised that will guarantee steady production, steady and satisfactory employment, profitable operation, and at the same time save for our future needs the vast amount of our fuel we now waste in producing enough coal for present needs—all with due regard for the laws of our country.

If we have any laws that stand in the way of conserving our fuel supply through improved mining methods, or that prevent the saving of the 400,000,000 tons permanently lost each year, or that would interfere with the profitable operation of mines, or with giving steady employment to the miners at just wages, I am sure the producers of coal have

James J. Davis

only to get together and present the case to the government officials responsible for the enforcement of these laws and charged with advancing the welfare of business and the worker. These officials will co-operate with them in every possible way and I am sure that Congress will aid by the passage of laws, or the amendment of existing laws, that would accomplish the purpose of guarding our future coal reserves and at the same time promote the interest of all engaged in mining bituminous coal. It is my experience that Congress is always ready and willing to cooperate in advancing the interests of any of our business enterprises so long as no attempt is made to interfere with, or take away from, the fundamental rights of our people.

UNITY FOR CONSERVATION

If a combination of companies is necessary to conserve our coal supply and operate our mines for present needs, to the equal benefit of owners, miners and the public, I doubt if the size of such corporation would cause any serious objection. I do not believe our people would protest the organization of any large corporation, or forty such organizations, if founded on the proper principles.

Again, if combination is the remedy, and if the leaders of the industry feel that the man to guide such a combination is wanting within their own ranks, they should go outside and select an outstanding man qualified by training, experience, ability, personality and standing, and give him such control as he may need to lift the industry from its present bog of troubles to the level of scientific management that prevails in nearly every other great American industry. Such director general should have all the authority needed to bring all parties engaged out of their differences into the single purpose of providing a steady supply of coal, with regular employment for enough miners to produce this adequate supply. With such unified control would go, as a matter of course, all the practice in use in other great business enterprises, such as systematic development of markets, new and old, here and abroad; the creation of laboratories for the discovery of new byproducts; the whole train of scientific activities necessary to put on the plane where it belongs the great basic coal industry, now lost in a chaos of antiquated and self-defeating methods.

"The way to abate the evil of overdevelopment is to close, at least for a time, the less profitable mines. This you cannot do unless the industry as a whole will bear the loss, and to do so it must be united. Yet if it were united, if disastrous competition were to cease, if all the elements of the industry were to get together on a practical, workable method of co-operation, this first and worst evil of overdevelopment could be ended almost at once."

CO-OPERATE AND CONSTRUCT

The American people have set up about themselves all the necessary legal safeguards but these have never stood in the way of the principle of unit in industry, as applied under due regulation. Organization, within due limits of law, brings down prices by bringing down waste, provides steady employment, develops trade expansion, and makes for general efficiency in operation, with profit to all. Every coal operator, every coal miner, should strive to bring this about, for every individual of the public outside the industry expects it to achieve some constructive thing to end the present chaos in the important industry of supplying the country with coal.

What Should Retail Merchant Expect From Producer?

By Roderick Stephens
Chairman, Committee on Government Relations, National Retail Coal Merchants' Association

Uniformity in quality and in standards of preparation is first essential. Other important factors are dependability of supply, stability of price, elimination of waste in transportation, avoidance of needless breakage and discouragement of superfluous competition.

THE PROGRESSIVE independent retailer seeks only such co-operation from his sources of supply as will aid him to meet the competition of competing fuels, and to maintain his proper markets. To successfully meet competition, a retailer must be able to render a service of quality, of supply and at a reasonable and stable price. The dealer is also entitled to expect co-operation in avoidance of waste and to reduce needless expense.

Quality is the first essential. Coal must not only be of good quality but it must also be uniform in standards of preparation. The mere fact that coal is found to be in accord with producers' standards of preparation means little unless such standards assure a product that will give satisfaction to the consumer. If the consumer's expectation of quality is unreasonable there is need for education of the consumer. However, while some consumers may be unreasonable, the average consumer does not expect unreasonable results.

Ash Reduction Needed

Notable progress has been made in recent years in reducing ash content on the smaller sizes of coal. Necessarily there have been pioneers in this movement, to whom much credit is due. There still remains, however, a considerable tonnage of steam coal sold by responsible producers which carries an excess of ash as compared with the better standards that prevail among the majority of the anthracite mining companies. The elimination of this high ash steam coal is very important.

Dependability of supply is perhaps the next most important factor. If freedom from frequent strikes can be secured, it remains only for the companies to assure adequate supplies to the retailers by proper adjustment of tonnage and intelligent distribution of such tonnage. While the ideal place for storage of coal is in the consumers' bins, it is a fact that many consumers are not equipped to store their winter's supply during the summer months and so long as this condition prevails it will be necessary for the companies to build up adequate storage piles during the summer, which tonnage together with the amount stored by the retailer in his yards, augmented by current production during the winter months, will be sufficient to assure consumers of required tonnage.

Price Stability Important

Stability of price is highly important if the goodwill of the consumer is to be maintained toward coal. Sudden midseason increases in price are strongly resented by the consumer and it would seem possible for large anthracite producers, at least, to establish definite price schedules to prevail each year.

Consideration of price policy naturally suggests the question of summer discounts. I believe it is the consensus of opinion among retailers based upon the experience of many years that under normal conditions a price inducement is necessary to induce the average buyer of coal to fill his bins during the summer.

Maintenance of retail market unimpaired is vital to the producer as well as to the retailer. Every piece of business lost to the retail trade reduces the dealers volume of sales and unless such business is profitless the result is to increase the dealer's cost of doing business and to necessitate a corresponding increase in retail margins and in sales price to the consumer. This point will suggest that the maintenance of a proper balance of retail tonnage as between steam and domestic sizes is dependent upon the ability of the dealer to hold whatever steam coal business originates in his territory. If this business is to be handled either directly by producing companies or wholesalers, the proportion of retailer's steam coal tonnage to domestic tonnage will be necessarily reduced. Where that is the case or where the retail market does not consume the normal proportion of steam coal, the dealer should not be subjected to pressure to take an undue proportion of the smaller sizes.

To the maintenance of retail markets, advertising is a force that should not be neglected. The producers of practically all basic commodities recognize it as their responsibility in part, to maintain the prestige of their commodity and to build goodwill through constant advertising of the merits of their products.

Another valuable piece of co-operation would be looking to the elimination of waste and the avoidance of needless expense. Loss of coal in transit between the mines and the dealer's yard is a subject worthy of careful study by all concerned. The burden of this loss is absorbed entirely by the retail trade, but necessarily enters into the retailer's cost of doing business and directly affects the price of coal to the consumer.

Avoidance of needless breakage of coal in handling at the piers in another factor worthy of careful study. Likewise reduction of demurrage at the loading piers is an item on which distributors and dealers could profitably co-operate.

Against Wasteful Competition

Finally, producers should discourage superfluous competition. The U. S. Coal Commission, in common with practically every other body that has seriously investigated the coal business, has commented upon the fact that in most communities there are too many retail dealers, resulting in a dilution of tonnage causing a corresponding increase in costs, margins and selling price.

Toward the maintenance of high ethical standards in the coal trade all branches of the industry should certainly co-operate, and if such co-operation resulted in the elimination of irresponsible dealers and a consequent concentration of tonnage in the hands of those dealers of greater responsibility, better service would be assured the consumer and the results would benefit all.

What Should Coal Producer Expect from Retailer?

By A. J. Maloney
Vice-President, Chicago, Wilmington & Franklin Coal Co.

Modern merchandising necessitates that the retailer sell consumer his season's requirements in advance of his actual needs. Mutual co-operation is necessary if both producer and retailer are to make a fair profit.

TEAM WORK is the soundest basis of relationship between the producer and the retailer of coal. The object of both is to make money, with as much enjoyment in the process as possible. Their mutual problem is to sell coal to the ultimate consumer on a thorough-going merchandising basis. Hence, their aims are not antagonistic.

By co-operating — working together—both sides can make more than by pulling apart. One can get along without the help of the other no more than one horse can pull a two-horse load.

Must Sell in Advance

Modern merchandising of coal means, for one thing, to sell the ultimate consumer his season's requirements of coal in advance of his actual needs. If the dealer can sell and deliver coal easily, it means that the producer of coal can keep his mines fairly well occupied during the spring and summer months—on a profitable basis, if possible, but surely on such a basis of activity as will reduce to the absolute minimum the so-called spring and summer losses in operation that shoot up the cost of mining. This is being accomplished.

The curve of operation of mining properties no longer has as many peaks and valleys in it as formerly. It is being leveled down by loyal and interesting and profitable co-operation between the producer of coal and the retailer of coal.

Goes Out After Business

The retailer no longer sits down and waits for the tide of demand to sweep over him in the fall and winter, on the theory that his customers will have to come to him then and pay whatever price for coal the retailer exacts. The up-to-the-minute man begins to reach out for business from his customers not later than the first of May. He tries to do as much business in the spring and summer months, when his costs of operation are lowest, as he possibly can. He finds that he cannot only do business profitably with his customers during those months, just as well as during the fall and winter, but also that he can win many of the customers of his competitors who are not up on their toes in trying to do business.

Modern merchandising also means that the dealer must sell a product the quality of which remains standard, and the supply of which is always readily available, so that his customers can get what they demand. It means not only that the product must be right, but that it must be pushed by modern advertising and selling methods.

Producer Co-operating

The producer of coal is greatly aiding the retailer of coal in this better method of merchandising: First, in providing coal of standard quality and always readily available. Second, in many instances, there is very close co-operation between producer and retailer in advertising campaigns to the ultimate consumer. These result in trade-mark coal finding a market under profitable conditions to both the producer and retailer.

Competition has been a healthful influence in stirring both producer and retailer to better methods of merchandising and to a more modern understanding of their joint responsibility to the ultimate consumer in the matter of good coal and service at a reasonable price. It seems not unlikely that as time goes on, the producer and retailer will jointly have to assume more responsibility to the ultimate consumer in the matter of his coal requirements.

Additional forms of service will have to be instituted, either directly or indirectly, to win the continued good will of the ultimate consumer. It will not be enough to supply him good coal at a reasonable price, when and as needed, but a system of inspection of furnaces, the development of new types of furnaces, the elimination of smoke, reduction in ash refuse, and other developments —all of which will put the ultimate consumer in a more friendly state of mind towards the use of coal—will have to be instituted. In other words, a real heating service to the consumer must be provided.

More Stable Markets

And then there will have to be developed more stability in market conditions. The ultimate consumer is ready to pay a reasonable price for good coal and service, but he doesn't like to have to follow the gyrations of an erratic market. He doesn't like to read on the front page of his morning newspaper that the coal interests—producer and retailer—are after him again with their eye solely on his bank account. It is almost needless to say that the future of the coal industry presents great allurement in the way of sound opportunity for those producers and retailers who are of a mind to study their responsibilities as business men and discharge those responsibilities in the light of progress.

Must Work Together

The time has come when coal dealer and coal producer working together must share the burden of selling coal to the ultimate consumer on a profitable basis. It has come because coal must be sold with modern merchandising methods, if sold profitably, and modern methods mean that producer and distributor must co-ordinate their plans and co-operate in carrying them out.

The time has past when coal sold itself. Marketing is the biggest problem confronting producers and distributors. Successful merchandising calls for a distribution chain that has no weak links. Such a chain can be forged only if there is mutual understanding and confidence between producer and distributor.

Noteworthy Progress Has Been Made Toward Sturdier and Permissible Types of Apparatus

Flameproof equipment finds way into all mines. Power trucks prove advantages of better operating voltage at face. Mechanical loading increases.

By Edgar Gealy
Assistant Editor, *Coal Age*
New York City

BROAD RECOGNITION of the fact that successful mine operation depends primarily upon the use of modern equipment has proved a great stimulus to the use and improvement of mining machinery during the past year. Settlement of the anthracite strike, the success of certain well-equipped, highly mechanized operating companies in union fields and the earning records of non-union mines that have found it possible to pay dividends and still put considerable capital back into their properties in the form of better equipment have been strong factors in directing the course of the whole coal-mining industry into a new and broader reconstruction period.

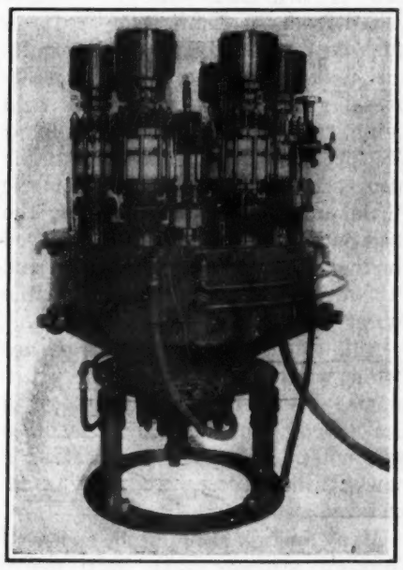
Durable Equipment Preferred

There is a new and greater consciousness of the desirability of strong, well-designed equipment. Its advantages and the necessity for its adoption are everywhere apparent and many companies are beginning to insist upon having it. It is now generally conceded that many lines of standard equipment cannot indefinitely withstand the rough service to which it is subjected in the mines. The more dependence mine operators place in mechanical and electrical devices the more necessary it has become that these devices be sturdily constructed. A failure anywhere in the system of a highly mechanized operation, such as already exists in some mines, interferes with the whole plan of operation and wipes out all its economic advantages.

The use of and demand for permissible mine equipment has grown rapidly. Its adoption is already exerting a revolutionizing influence on the use of electricity inside the mines. Besides making an operation safer from gas explosions, where used, it also protects the mine from dust ignitions, fire and shock hazards. Appreciating these advantages, manufacturers of a few types of such apparatus already are planning to make permissible equipment their standard line. Mine operators in turn are extending the use of such equipment to mines which are not considered gassy.

Along this same line there has been a marked increase in the use of power-truck equipment. These outfits are now being designed in both the open and flame-proof types. The advantages they have shown have accentuated the benefits and desirability of better voltage conditions at the working face and promoted improvements in feeder and return circuits carrying energy to and from the working faces where direct-current is used in the ordinary manner.

Flame-proof switch gear primarily designed for operation in and around the mines has been introduced into this country from England. This equipment meets a growing need for safe control of electrical apparatus of both standard and permissible types either already available or under contemplation.



Mercury-Arc Rectifiers Are Being Applied to Mine Service

This is a 500-kw. 600-volt rectifier unit of the latest type. The first large mercury-arc rectifier in the coal field has now been in operation for over three months. Parallel operation has been accomplished with a motor-generator set and a rotary converter.

The demand for larger tonnages, the necessity of mining thinner beds and the economic desirability of a continuous flow of coal to the preparation plant have resulted in several new developments in haulage systems. Storage-battery locomotives of the permissible type have been designed or improved by nearly all the manufacturers making such equipment.

Adopt Low-Speed Locomotives

There has been a marked trend toward the adoption of electric gathering locomotives of low speed. Several machines of various types running at full-load speeds of approximately 3½ mi. per hour are now available. Semi-magnetic motor control and automatic change-over from trolley to reel have been incorporated in the design of low-height gathering locomotives.

Larger-capacity mine cars specially built for rapid main-haulage transportation have been more widely adopted. Anti-friction mine-car wheel bearings have made unusual strides, until today it is estimated that 40 per cent of the 997,000 cars used in this country are now equipped with anti-friction bearings.

Changes directed toward the production of increased tonnages have naturally created a demand for large hoist equipment. Improvements in design have made possible safer and cheaper operation at much higher speeds than have been heretofore practiced with steam-driven units. Having replaced by electrical drives much of the oldtime steam-operated equipment — excepting the main hoists—many mining companies have indicated that the present year will see the complete electrification of

their plants and the use of many large electric shaft hoists.

Mining in thin beds at greater distances from the main haulageways has promoted the use of more scraper hoists. Further developments have taken place in the design of portable scraper hoists, particularly in the electric-motor driven types.

Improvements in the design of pumping equipment have been made with the idea of perfecting operation in acidulous and gritty water. There has been a marked increase in the use of manganese, rubber-lined and special alloy pumps. Several new features of control have been added to the equipment used with automatically controlled centrifugal machines. These new features assure more perfect functioning of the pump and quicker detection of abnormal conditions.

Following a Definitely Indicated Trend This New Loading Machine Is of the Permissible Type

A 35-hp. permissible motor together with similarly approved controller and resistance equipment constitute the major improved features of this loading machine. Recognizing the economic advantages of mechanical loading many users of this type of apparatus have made large savings in production costs during the past year.

POWER IS CONSERVED

Advances in power-converting control apparatus have done much to reduce the power losses incurred in feeder systems. Conversion equipment is now being placed nearer the load centers or in positions most suitable for successful mine operation. Several two-station outfits have been designed and stations with load-limiting control are now in service. One of the most recent developments along this line was the installation of a mercury-arc rectifier outfit in the anthracite field.

A new design of automatic reclosing device for sectionalizing inside feeder lines provides automatic over-current protection in that it disconnects the overloaded or short-circuited section of line from the remainder of the system, and reconnects it when normal conditions are restored. The load-indicating resistor scheme is used for actuating the reclosing feature.

Permissible motor equipment has been added to at least two popular types of mechanical loading machines. One outfit consists of a reel capable of spooling 400 ft. of rubber-sheathed mining-machine cable, a permissible motor, control box and headlight. At the close of the year another company announced the following changes in its loading machine: Wide side flanges have been added to the top and hopper conveyors; government-approved electric equipment consisting of a 35-hp. motor, a controller and resistance built in one unit with the resistance packed in sand to give better heat radiation and support; magnetic control and protection against overload or excessive heating.

Variable-voltage control has been generally accepted as the most suitable means for governing the action of the motors employed on electric shovels. Much progress has been made in designing motors of heavier, stronger materials than before, thus greatly reducing maintenance costs.

Automatic control of synchronous motor-driven air compressors has been accomplished. The synchronous motor actuating the compressor is direct-connected to its crankshaft and is provided with an exciter belted from the compressor shaft. A push-button controlled panel permits the unit to be started by merely pressing a button, the motor field being "thrown in" automatically at the proper time. The machine is also provided with an automatic initial unloading device, causing the load on the compressor to be relieved during the starting operation and "thrown on" automatically when the motor reaches synchronous speed.

Additional control features are being worked out to provide automatic operation of compressors to the extent that manual attendance will not be necessary even should a power failure occur and service be restored some time later.

Many installations of modern coal cleaning systems have been made, most of which have been slightly modified to suit the grade of material being treated. Coal ranging from dust to steam size can now be successfully "picked" mechanically. For cleaning materials smaller than 60 mesh, oil flotation is often used.

Two important improvements have been made in pneumatic coal cleaning. The first is the terraced or step-type of table deck for the large sizes and the second the externally controlled louvres for the distribution of the air over the bottom surface of the separating deck.

UNIQUE CUTTERS DEVELOPED

A thin-vein longwall coal cutter only 12 in. in height, driven by either an electric motor or an air engine, has been introduced during the past year. In addition, a new self-propelling electric-driven shearing machine has been developed and applied. Undercuts, overcuts or shearing cuts can be made with a new electrically-driven track cutting machine. This cutter is adjustable for height so that kerfs can be made anywhere in a seam.

In hammer drills, a new heavy sinker held by hand and a new rotary or auger drill for soft and broken ground have been adapted to the mining field. A new light model drill sharpener, weighing only 1,100 lb., has been designed for use where the larger sizes of steel are not required.

Where greatest progress in mine modernization has been made, there is a noticeable trend toward the elimination of home-made equipment and the use of strong, sturdy, well-adapted products. The movement toward automatic equipment and apparatus of better construction for both gassy and non-gassy mines continues and bids fair to revolutionize mine electrical installations as well as many well established mining practices.

Classification of Mines by Wage-Contract Policy Of Coal Operators*

By F. G. Tryon and H. O. Rogers
U. S. Bureau of Mines

If the United Mine Workers call a strike on April 1, what effect will it have upon soft-coal output? Nobody really knows. The U. S. Bureau of Mines, however, has just completed a study on changes in contractual relations in 1925, and Messrs. Tryon and Rogers here present the results of that study.

NO QUESTION has been asked of the coal statistical section of the U. S. Bureau of Mines more frequently in recent months than, "What is the relative production of the union and non-union bituminous mines?" To throw light on this point, the Bureau included in its statistical report card for 1925, which was sent to the operators of all mines producing over 2,000 tons of coal, the following inquiry:

> "Was this mine under wage contract with the United Mine Workers of America on Jan. 1, 1925? ..... On Dec. 31, 1925? ....."

Information was received from 5,967 mines out of 7,144 that operated in 1925. The question was not asked of the so-called "local commercial" operators, who produce less than 2,000 tons a year, and most of the 1,177 mines not reporting belonged to this class of small producers. Nearly all of the "commercial" producers replied to the question. The returns may be considered thoroughly representative, because the mines reporting produced 96.9 per cent of the total output from all mines and included 95.5 per cent of the total number of men employed in 1925.

Table I summarizes the operators' replies to the inquiry. It will be seen that of the mines reporting, the group whose owners stated they were under wage contract with the union produced 34.7 per cent of the tonnage and employed 38.7 per cent of the men. (These percentages are based on the total reporting, excluding the mines for which information was not available.)

The group whose owners stated they were not under wage contract produced 62.4 per cent of the tonnage and employed 56.3 per cent of the men. A third group who stated that they were under wage contract at the beginning of the year but not at the end, accounted for 2.9 per cent of the tonnage and 5.0 per cent of the men. The total of the second and third groups, including all those who stated they were not under contract at the end of the year, produced 65.3 per cent of the tonnage and employed 61.3 per cent of the men.

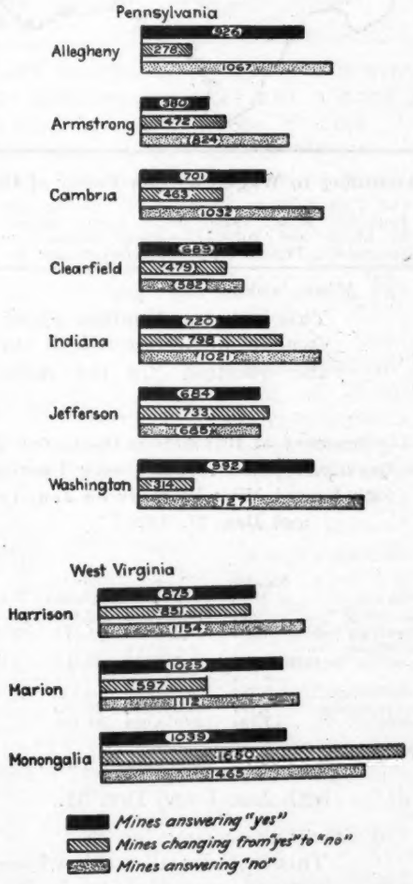


Fig. 2—Comparative Output per Man Employed, 1925

In mines whose owners stated that they were not under contract with the union the output per man was generally greater in 1925, indicating steadier working time. In mines which changed from a contract to a non-contract basis the output was generally smaller than in either of the other two classes of mines in the same county. The average figures for each group are inserted in the bars. They are calculated by dividing the tons produced by the average number of men employed.

WHAT FIGURES SHOW

Clearly information collected wholly from the operator is *ex parte* testimony. *The table records the operator's statement of his labor policy. It is simply a record of his position as recognizing or not recognizing a contractual relation with a particular union, in this case the United Mine Workers of America.* Many of the operators who replied "no," particularly in northern West Virginia and Pennsylvania, would doubtless be listed by the union as signers of the present wage agreement and considered by the union as under contractual obligation to continue that agreement. The figures, therefore, do not show the number of mines that were parties to the existing contract or that might be considered morally bound by it. Many mines signing that agreement have shut down, and some continuing to operate have broken it.

The figures do not show the tonnage working at the union scale or under union conditions. There are non-union operators whose fixed policy is to pay the union scale and it is well known that last fall the non-union fields of the East lying adjacent to the union fields advanced wages to the equivalent of the union level. On the other hand there may have been union operators in 1925 who, without repudiating the contract, obtained some concessions in rates from their own men.

The figures do not show the number of union members. There are thousands of union men who were without employment in 1925 and therefore would not be counted on the mine payrolls. There are doubtless thousands of other members who

*Published by permission of the director, U. S. Bureau of Mines. C. P. White, chief, Coal Division. The writers are indebted to Raymond Kenny for valuable assistance in editing the returns.

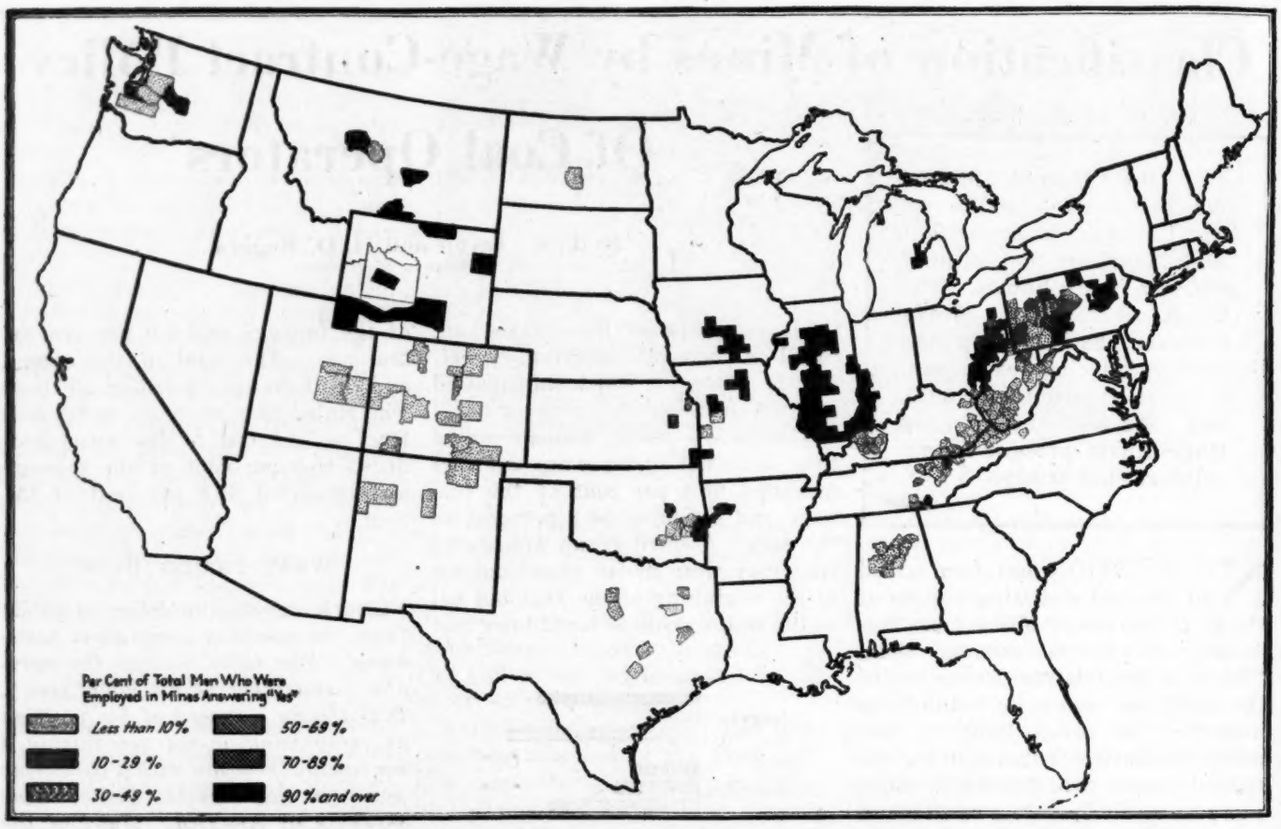


Fig. 1—Classification of Mines According to Wage-Contract Policy of Operators as of December 31, 1925

The map shows the percentage of the total number employed in each country who worked in mines where the operator stated he was under wage contract with the United Mine Workers of America on Dec. 31, 1925. Solid union areas appear in black and solid non-union areas are speckled. The gradations between are indicated by the density of the shading. The percentages are based upon the total number reporting and excludes mines for which no information was received.

are working for operators that recognize no contract.

The figures, therefore, do not show the number of men who might respond to a strike call, or the tonnage that might be produced in the event of a strike. The response to a strike depends on other factors as well as on the statement of the operator as to whether he is working under a wage contract. This was shown in the suspension of 1922.

The figures purport to show none of these things, though they may throw light upon them. They are simply a tabulation of the operators' statements as to their contract policy on two specific dates. In presenting them the writers are not undertaking to pass on the merits of a controversy. The breaking of a wage contract involves some plain questions of right and wrong that do not, however, concern us here. Our statement is simply that a specific question has been asked of the operators and that a careful tabulation of their answers has been made. In this tabulation the replies follow:

(a) *Mines answering "yes"*
This includes all mines whose owners answered "yes" to the question "Is the mine under wage contract?" for both Jan. 1 and Dec. 31.

(b) *Mines answering "no"*
This includes all mines whose owners answered "no" for both Jan. 1 and Dec. 31.

(c) *Mines changing from "yes" to "no"*
This group includes all mines whose owners answered "yes" for Jan. 1 and "no" for Dec. 31.

(d) *Mines not answering question*
This group are "local commercial mines" of less than 2,000 tons, from whom as already explained the question was not asked.

Table I—Summary of Bituminous Operators' Replies to Question: "Was Mine Under Contract with United Mine Workers on Jan. 1 and Dec. 31, 1925?"

Classification	Number of Mines	Tons Produced	Men Employed	Per Cent of Total Reporting: Tons	Per Cent of Total Reporting: Men
Mines answering "yes"	1,602	174,875,000	217,398	34.7	38.7
Mines answering "no"..	4,152	314,342,000	316,775	62.4	56.3
Mines changing from "yes" to "no" in 1925	213	14,792,000	28,165	2.9	5.0
Total reporting.....	5,967	504,009,000	562,338	100.0	100.0
Mines not reporting....	1,177	16,045,000	26,155	.....	.....
Grand total.....	7,144	520,054,000	588,493	.....	.....

These four headings are carried throughout the analysis which follows. In Table II are given the number of mines and tonnage for each class. This table will serve to indicate the degree of completeness of the returns from each state. For the country as a whole the tonnage not replying is 3.1 per cent of the total output. For Pennsylvania, the information is 96.1 per cent complete; for Ohio, 92.8 per cent; for West Virginia, 97.8 per cent. The returns are thus thoroughly representative, except perhaps for Oklahoma where the missing tonnage amounts to 23.6 per cent, and for Kansas and Arkansas where it is 14.9 and 14.0 per cent respectively.

Neither the number of mines, or the actual production in 1925, however, is as good an indicator of potential production as is the number of men, because of the fact that so

Table II—Number and Production of Bituminous Mines Classified According to Operators' Replies to Question as to Wage Contract on Jan. 1 and Dec. 31, 1925

	Mines Answering "Yes"			Mines Answering "No"			Mines Changing From "Yes" to "No"			Mines Not Replying			Total	
State	Number of Mines	Production Net Tons	Per Cent of Total Production	Number of Mines	Production Net Tons	Per Cent of Total Production	Number of Mines	Production Net Tons	Per Cent of Total Production	Number of Mines	Production Net Tons	Per Cent of Total Production	Number of Mines	Production Net Tons
Alabama	.....	.....	.....	231	19,830,000	99.1	...	.....	....	8	175,000	0.9	239	20,005,000
Alaska	.....	.....	.....	9	83,000	100	...	.....	....	.....	.....	.....	9	83,000
Arkansas	47	625,000	51.2	20	300,000	24.6	7	124,000	10.2	22	171,000	14.0	96	1,220,000
Colorado	.....	.....	.....	221	9,984,000	96.8	....	.....	....	8	326,000	3.2	229	10,310,000
Georgia	.....	.....	.....	1	66,000	100	....	.....	....	.....	.....	.....	1	66,000
Idaho	.....	.....	.....	1	2,000	100	....	.....	....	.....	.....	.....	1	2,000
Illinois	285	64,902,000	97.0	37	790,000	1.2	3	11,000	....	141	1,206,000	1.8	466	66,909,000
Indiana	140	19,597,000	92.3	22	692,000	3.3	....	.....	....	41	938,000	4.4	203	21,227,000
Iowa	122	4,404,000	93.4	21	81,000	1.7	4	54,000	1.2	60	176,000	3.7	207	4,715,000
Kansas	79	3,471,000	76.7	27	243,000	5.4	4	138,000	3.0	120	672,000	14.9	230	4,524,000
Kentucky	1	16,000	.03	608	53,086,000	96.4	9	917,000	1.6	23	1,049,000	1.9	641	55,068,000
Maryland	.....	.....	.....	71	2,665,000	98.9	....	.....	....	17	30,000	1.1	88	2,695,000
Michigan	8	791,000	97.9	2	17,000	2.1	....	.....	....	.....	.....	.....	10	808,000
Missouri	48	1,938,000	71.9	47	442,000	16.4	2	50,000	1.9	57	264,000	9.8	154	2,694,000
Montana	18	2,181,000	71.6	29	852,000	28.0	....	.....	....	5	11,000	0.4	52	3,044,000
New Mexico	.....	.....	.....	37	2,555,000	99.9	....	.....	....	1	2,000	0.1	38	2,557,000
North Carolina	.....	.....	.....	2	65,000	100	....	.....	....	.....	.....	.....	2	65,000
North Dakota	.....	.....	.....	149	1,312,000	99.0	....	.....	....	3	13,000	1.0	152	1,325,000
Ohio	278	21,239,000	75.7	107	4,158,000	14.9	15	630,000	2.2	239	2,007,000	7.2	639	28,034,000
Oklahoma	8	214,000	9.2	54	1,323,000	56.9	9	239,000	10.3	29	550,000	23.6	100	2,326,000
Oregon	.....	.....	.....	1	10,000	100	....	.....	....	.....	.....	.....	1	10,000
Pennsylvania	432	41,756,000	30.5	1,133	82,776,000	60.5	110	7,059,000	5.1	299	5,337,000	3.9	1,974	136,928,000
Tennessee	5	258,000	4.7	86	4,910,000	90.0	....	.....	....	20	287,000	5.3	111	5,455,000
Texas	.....	.....	.....	37	1,008,000	100	....	.....	....	.....	.....	.....	37	1,008,000
Utah	.....	.....	.....	37	4,633,000	98.8	....	.....	....	4	57,000	1.2	41	4,690,000
Virginia	.....	.....	.....	112	12,794,000	99.9	....	.....	....	1	6,000	.01	113	12,800,000
Washington	11	1,150,000	45.3	43	1,362,000	53.7	....	.....	....	2	25,000	1.0	56	2,537,000
West Virginia	73	5,850,000	4.8	999	108,251,000	88.5	50	5,570,000	4.5	51	2,709,000	2.2	1,173	122,380,000
Wyoming	47	6,483,000	98.9	7	52,000	0.8	....	.....	....	7	18,000	0.3	61	6,553,000
Other States *a*	.....	.....	.....	1	*b*	.....	....	.....	....	19	16,000	100.0	20	16,000
Total	1,602	174,875,000	33.6	4,152	314,342,000	60.4	213	14,792,000	2.9	1,177	16,045,000	3.1	7,144	520,054,000

a California and South Dakota. *b* Less than 500 tons.

many mines were running short time in 1925. The union mines in particular are physically capable of greatly increasing their output over the level of that year. Table III continues the analysis by showing the number of men employed by each of the four groups of mines.

Table III—Number of Men Employed in Bituminous Mines Classified According to Operators' Replies to Question on Wage-Contract Status

	Average Number of Men Employed					
State	Mines Answering "Yes"	Mines Answering "No"	Mines Changing From "Yes" to "No"	Total Reporting	Not Replying	Total
Alabama	.....	26,823	.....	26,823	274	27,097
Alaska	.....	157	.....	157	.....	157
Arkansas	1,761	620	661	3,042	596	3,638
Colorado	.....	12,886	.....	12,886	317	13,203
Georgia	.....	137	.....	137	.....	137
Idaho	.....	10	.....	10	.....	10
Illinois	74,815	581	84	75,480	2,343	77,823
Indiana	20,184	602	60	20,846	1,886	22,732
Iowa	9,309	221	179	9,709	458	10,167
Kansas	5,277	905	202	6,384	1,416	7,800
Kentucky	26	54,949	1,016	55,991	1,033	57,024
Maryland	.....	3,543	.....	3,543	37	3,580
Michigan	1,548	31	.....	1,579	.....	1,579
Missouri	3,268	799	132	4,199	915	5,114
Montana	2,314	345	.....	2,659	21	2,680
New Mexico	.....	3,440	.....	3,440	4	3,444
North Carolina	.....	140	.....	140	.....	140
North Dakota	.....	1,291	.....	1,291	16	1,307
Ohio	33,408	3,331	221	36,960	2,698	39,658
Oklahoma	553	2,711	607	3,871	1,760	5,631
Oregon	.....	21	.....	21	.....	21
Pennsylvania	51,003	79,665	17,814	148,482	8,316	156,798
Tennessee	529	7,277	.....	7,806	508	8,314
Texas	.....	1,868	.....	1,868	240	2,108
Utah	.....	4,225	.....	4,225	216	4,441
Virginia	.....	13,677	.....	13,677	.....	13,677
Washington	1,555	2,127	.....	3,682	44	3,726
West Virginia	5,693	94,342	7,189	107,224	2,965	110,189
Wyoming	6,155	47	.....	6,202	36	6,238
Other States *a*	.....	4	.....	4	56	60
Total	217,398	316,775	28,165	562,338	26,155	588,493

a California and South Dakota.

It will be seen that practically all the men in Illinois for whom information was received fall in the group answering "yes." The few in the group answering "no" are chiefly men working in co-operative mines, or in mines connected with a manufacturing plant whose product is consumed on the premises. They are not "non-union" in the ordinary sense.

A somewhat larger proportion in the group answering "no" is found in Ohio. The entry of 3,331 men in Ohio includes a number of stripping operations and mines associated with brick and tile works, some of which specifically stated that though not under wage contract they paid the union scale. In Pennsylvania 51,003 men were employed in mines answering "yes" and 79,665 in mines answering "no." A further 17,814 men were employed at mines that changed from "yes" to "no" during the year. The mines not replying accounted for 8,316 men.

In West Virginia, the number of men employed by mines answering "yes" was 5,693, most of whom were in the northern counties and the Panhandle. In Kentucky only one mine reported a wage contract and it employed only 26 men.

The percentage of men in each class is given in Table IV. In calculating these percentages, the group of mines not reporting have been eliminated so that the figures represent the proportion of the total men

Table IV—Per Cent of Total Men Employed in Mines That Reported Wage-Contract Status in 1925, Classified According to Operators' Replies

(The percentages are calculated on the basis of mines reporting, eliminating those not answering the question.)

State	In Mines Answering "Yes" Per Cent	In Mines Answering "No" Per Cent	In Mines Changing From "Yes" to "No" During Year Per Cent	In All Mines Whose Status Was "No" at End of Year Per Cent
Alabama	....	100	....	100
Alaska	....	100	....	100
Arkansas	57.9	20.4	21.7	42.1
Colorado	....	100	....	100
Georgia	....	100	....	100
Idaho	....	100	....	100
Illinois	99.1	0.1	0.1	0.9
Indiana	96.8	2.9	0.3	3.2
Iowa	95.9	2.3	1.8	4.1
Kansas	82.6	14.2	3.2	17.4
Kentucky	0.1	98.1	1.8	99.9
Maryland	....	100	....	100
Michigan	98.0	2.0	....	2.0
Missouri	77.8	19.0	3.2	22.2
Montana	87.0	13.0	....	13.0
New Mexico	....	100	....	100
North Carolina	....	100	....	100
North Dakota	....	100	....	100
Ohio	90.4	9.0	0.6	9.6
Oklahoma	14.3	70.0	15.7	85.7
Oregon	....	100	....	100
Pennsylvania	34.3	53.7	12.0	65.7
Tennessee	6.8	93.2	....	93.2
Texas	....	100	....	100
Utah	....	100	....	100
Virginia	....	100	....	100
Washington	42.2	57.8	....	57.8
West Virginia	5.3	88.0	6.7	94.7
Wyoming	99.2	0.8	....	0.8
Total	38.7	56.3	5.0	61.3

Table V—Details by Counties in Pennsylvania and Northern West Virginia of Number of Men Employed in Bituminous Mines, Classified According to Operators' Replies to Question on Wage-Contract Status

State and County	Average Number of Men Employed: Mines Answering "Yes"	Mines Answering "No"	Mines Changing From "Yes" to "No"	Total Reporting	Not Answering	Total
Pennsylvania						
Allegheny	9,528	1,403	3,990	14,921	1,307	16,228
Armstrong	137	2,363	2,195	4,695	170	4,865
Beaver	.....	299	.....	299	58	357
Bedford	832	92	.....	924	61	985
Blair	109	63	.....	172	.....	172
Bradford	.....	18	.....	18	.....	18
Butler	108	2,129	.....	2,237	307	2,544
Cambria	13,088	6,871	246	20,205	1,064	21,269
Center	354	843	101	1,298	279	1,577
Clarion	552	1,748	51	2,351	38	2,389
Clearfield	3,947	2,993	1,144	8,084	1,127	9,211
Clinton	.....	297	.....	297	.....	297
Elk	1,360	100	114	1,574	124	1,698
Fayette	382	23,731	1,160	25,273	1,100	26,373
Fulton	280	.....	.....	280	.....	280
Greene	.....	3,661	.....	3,661	87	3,748
Huntingdon	1,254	48	.....	1,302	140	1,442
Indiana	2,886	4,091	2,351	9,328	266	9,594
Jefferson	1,719	1,771	566	4,056	348	4,404
Lawrence	.....	212	.....	212	121	333
Lycoming	.....	66	.....	66	.....	66
McKean	.....	19	.....	19	.....	19
Mercer	.....	404	.....	404	.....	404
Somerset	.....	9,050	.....	9,050	1,245	10,295
Tioga	805	18	.....	823	21	844
Washington	12,022	1,304	5,102	18,428	435	18,863
Westmoreland	1,640	16,052	794	18,486	18	18,504
Venango	.....	19	.....	19	.....	19
State total	51,003	79,665	17,814	148,482	8,316	156,798
Northern West Virginia						
Barbour	91	918	1,020	2,029	218	2,247
Brooke	266	1,246	.....	1,512	19	1,531
Harrison	24	2,203	2,569	4,796	1,426	6,222
Marion	708	1,801	3,280	5,789	.....	5,789
Marshall	26	1,616	.....	1,642	.....	1,642
Monongalia	2,642	3,489	283	6,414	127	6,541
Ohio	1,510	849	.....	2,359	75	2,434
Preston	.....	1,909	.....	1,909	.....	1,909
Randolph	.....	690	.....	690	.....	690
Taylor	.....	1,103	.....	1,103	.....	1,103
Upshur	.....	702	.....	702	.....	702
Total	5,267	16,526	7,152	28,945	1,865	30,810

for those mines whose contract policy was definitely reported. The first column gives the percentage in mines answering "yes," which in Pennsylvania for example was 34.3. The second column gives the percentage in mines answering "no," in Pennsylvania 53.7. The percentage in the third column, which in Pennsylvania is 12.0, represents the mines changing from "yes" to "no" during 1925. By adding together the percentages in columns 2 and 3, one gets the percentage in all mines whose status was "no" at the end of 1925. For Pennsylvania this is 65.7 per cent.

Table VI—Comparative Output per Man Employed in Certain Counties, 1925

(Figures represent the tons produced divided by the average number of men employed.)

State and County	Output per Man in: Mines Answering "Yes"	Mines Answering "No"	Mines Changing From "Yes" to "No"
Pennsylvania	Tons	Tons	Tons
Allegheny	926	1,067	278
Armstrong	380	824	472
Cambria	701	1,032	463
Clearfield	689	582	479
Indiana	720	1,021	798
Jefferson	684	685	733
Washington	992	1,271	314
West Virginia			
Harrison	875	1,154	851
Marion	1,025	1,112	597
Monongalia	1,039	1,465	1,650

Table IV in conjunction with the map in Fig. 1, which shows the same thing by counties, gives a birdseye view of the relative proportion of the contract and non-contract operations. South of the Ohio and Potomac Rivers and east of the Mississippi, the mines reporting a wage contract as of Dec. 31, 1925, were few indeed, outside of two counties in Tennessee, and scattering operations in Mason, Monongalia, Marion, and the Panhandle counties of West Virginia. The only solid black areas on the map of Pennsylvania are the anthracite counties (which are drawn in the map though not included in the tables), the counties covering the Broadtop field, and Tioga County.

On Contract Basis

Ohio, Illinois, Indiana, Michigan, Iowa and parts of Kansas and Missouri remain dominantly on the contract basis, but in much of Oklahoma and Arkansas the proportion of non-contract mines is high. Texas has now become completely non-union.

In the far west Wyoming and part of Montana are still on a solid contract basis. Washington is about evenly divided. The southern Rocky Mountain fields are entirely non-contract.

Changes in Status

A total of 213 mines, producing 14,792,000 tons and employing 28,165 men were reported by their owners as changing from contract to non-contract relations in 1925. Of the men involved, 17,814 were in Pennsylvania and 7,189 were in West Virginia. Table V gives the details of men employed under the four classifications for each county in Pennsylvania and for certain selected counties in the northern portion of West Virgina.

What effect did the labor policy of the operator, as indicated by his statement as to whether he worked under a wage contract, have on the steadiness of his working time, and so on the amount of employment for the miner? A partial answer to this question is given by Table VI which compares the average output per man for each group of operations. Limiting the comparison to a particular county where the natural conditions are fairly uniform, if the output per man is much greater in one set of mines it will be chiefly because they get more days of work. By this test, which is shown graphically in Fig. 2, it will be seen that the non-contract mines—the mines answering "no"—operated rather more steadily than the contract mines in the same counties. The mines which changed status from "yes" to "no," on the contrary, generally showed a smaller output per man in 1925 than either of the other groups.

Warns Against Misconstruing

It must be remembered that these figures show conditions a year ago, at the end of 1925. Since then, there may have been further changes of status by operators who reported themselves under wage contract in 1925, but have broken off contract relations since. On the other hand the revival of business in late 1926 caused a great many mines to reopen and most probably increased the number of men at work on a contract basis.

In conclusion, it must be reiterated that these figures do not profess to show union membership. Many men in mines whose owners declare themselves not now under wage contract are loyal union men. Still less do figures of this kind measure the possible response to a strike call, as is shown by the record of the strike of 1922. In that strike some 40,000 non-union miners joined, and at the moment of maximum effectiveness the strike shut down 81 per cent of the Connellsville district, 65 per cent of the Westmoreland district and 88 per cent of the Somerset district, all of which had been counted on before the strike as being non-union strongholds.

The figures here given represent only one element in a complex situation, namely the declared wage-contract policy of the operators on Dec. 31, 1925.

MINING REVIEW

Mergers Feature Year of Ups and Downs—Improvements Put Through by Careful Financing—Concentration Sought

Specter of Regulation and Fickle Market Hamper Operating Progress

March of modern methods beset by many pitfalls. High wages handicap union fields in competing with open-shop operations

BETWEEN the Scylla of government regulation and the Charybdis of labor difficulties the coal industry has had its share of obstacles to expansion and modernization of operating methods in the effort to produce coal more efficiently and keep costs from mounting. The union fields, with few exceptions, were hampered by the Jacksonville scale in trying to compete with the non-union regions working at lower wages. The strike of British coal miners it is true caused a flurry in the late fall that enabled many union operators to stay out of red ink, but on the whole the Southern fields had all the better of the struggle for business. Therefore it is scarcely surprising that a very large percentage of the new projects had their inception in West Virginia, Kentucky, Alabama and central Pennsylvania. Many improvements also went through in the anthracite region of Pennsylvania, which, being solidly union, wasn't harried by competition.

Alabama Mines Modernized

A long step in coal-mine modernization was taken in Alabama in 1926. Nearly all the large companies increased their coal-washing facilities, new buildings being a conspicuous feature in the program of expansion of some of the operators. The Yolande Coal & Coke Co. completed the rehabilitation of the Connellsville mine, in Tuscaloosa County, at a cost of $200,000. In the Blue Creek field, the Black Diamond Coal Co. greatly enlarged its facilities, adding a new washery.

Development work by Moss & McCormack included the sinking of several drift openings in Fayette County and two slopes in Walker County. Production was started early in the year at the new slope of the Brookside-Pratt Mining Co.'s Warrior River plant. The company also acquired properties of the New River Coal Co. in Marion County and planned a new washery, picking tables and other modern equipment at the Turner mine. The Barney mines of the Barney Coal Co., in Walker County, were acquired by the Alabama By-Products Corporation, which also constructed a new washery at its No. 10 mine, at Dora. Arrangements were made by the Birmingham Coal & Iron Co. to increase output in the Oneonta section, Blount County, to 1,000 tons daily.

A new slope costing approximately $150,000 was put in by the Stith Coal Co. at its operation near Aldridge, which increased the daily output from 800 tons to 2,000. The Pratt Fuel Corporation purchased 13,000 acres of coal land, including six operations, in Walker County, besides increasing output at Cedron No. 1 mine, a strip operation near Carbon Hill. Electric motors were installed by the Montevallo Coal Mining Co. to displace steam equipment. The De Bardeleben Coal Corporation doubled the capacity of its Corona mine No. 14 and brought output at mine No. 15, a new development, up to 500 tons per day.

The movement of coal by water from the Alabama coal fields to Southern ports was greatly increased as a result of improvements at the terminals on the Warrior River by the Inland Waterways Service, the addition of barges, rolling stock and additions to motive power by the Tennessee Coal, Iron & Railroad Co.

Impetus to the movement for greater safety in coal mining was shown in the organization of new chapters of the Holmes Safety Association, convict operations being numbered among those that joined the ranks.

Plans are under way by the Carolina Coal Co., Coal Glen, N. C., to increase the tonnage from the present average of 125 tons per day to 150 and possibly to 175. The old tipples are being rebuilt to a certain extent and general repairs at the plants at the two mines are being made. A new electric undercutting machine was bought last year, but due to the dipping seam it is not used to any great extent. Since the explosion in May, 1925, in which 53 men were killed, rock-dusting and sprinkling machines have been added and the ventilation system has been improved through the installation of bigger and better fans. One man is retained by the company for the sole purpose of keeping down the coal dust.

A reorganization recently took place through which I. Heckenbleikner assumed the controlling interest. The ultimate aim of the present owners is to establish a byproduct plant at least large enough to use the present output of coal of both mines.

In the eastern district of Tennessee the Fork Ridge Coal Co., one of the largest producers in the state, which was shut down for more than a year, partly because of market conditions as well as for repairs, resumed operations a few months ago. The Clairfield Jellico Coal Co., in Claiborne County, was succeeded on Sept. 1 by the Virginia Jellico Coal Co., which is making considerable improvements to increase tonnage and reduce the cost of production. A new property nearby is being opened up by S. E. Cleage and John Wills and a railroad extended for one mile or more. The company that operated under the name of the Campbell Coal Mining Co. for several years, with Mr. Alex Bonnyman as its president and manager, has changed its corporate name to the Blue Diamond Coal Co.

Guards Against Explosions

The Roane Iron Co., in the Middle District, has put its mine on the closed-light system and adopted rules by which no entry is to be driven more than 8 ft. in height and of a certain width, and has increased its ventilation more than 25 per cent, in an effort to eliminate possibility of explosion. The Cumberland Coal Co., of which L. Clark is president, is opening up the properties formerly owned and operated by the Isoline Coal Co. in the Isoline seam near Crossville.

At Whiteside, in the Western District, the H. L. Cory Coal Co. has opened up and is about ready to begin mining coal in what is known as the Rattlesnake seam. It is proposed by this company to produce from 300 to 500 tons of coal per day within the next few months. The Tennessee-Georgia Coal Co. also is opening a small mine about ten miles out of Chattanooga, in the old Etna seam, and is producing about 100 tons of coal per day.

The Consolidated Coal & Iron Co.,

of Tracy City has obtained control of the properties in the Sewanee seam, formerly owned and operated by the Tracy City Fuel Co., which had been closed down for more than a year, and has begun a stripping operation. Preparations are being made to load from 300 to 500 tons per day.

Up to the present time, the Tennessee Coal, Iron & Railroad Co.'s No. 5 mine, at Whitwell, is the only mine in the state that has adopted the use of rock dust for the prevention of dust explosions. It is considered possible, however, that the mining laws will be changed considerably at the present session of the Legislature.

MORE MECHANIZATION IN KENTUCKY

Machine cutting in Kentucky coal mines increased nearly 5 per cent last year, approximately 92 per cent of the year's output of 60,000,000 tons having been cut in that way. Average output per man was about 1,000 tons, a gain of 37 tons over the preceding year. Modernization in a mechanical sense is keeping pace in other directions too, which is emphasized by the introduction of more efficient underground machinery and up-to-date tipple equipment which makes it possible to turn out better prepared coals suitable for all purposes. Typical of the march of modernization is the Green River Fuel Co., at Mogg, which has enlarged its tipple to a five-track plant, added automatic cagers, picking tables, loading booms and rescreening equipment and increased its power plant.

Virginia started the year just closed easily maintaining its position as eighth among the coal-producing states of the country. An outstanding development of importance to the industry in this state was the launching of the financing program of the Wakenva Coal Co., organized by C. Bascom Slemp late in the preceding year. The company took over some rich coal properties in Dickenson County and added new and modern plants. The Freeburn Coal Co., Richmond, capitalized at $300,000, began extensive development. Another new firm organized to mine and sell coal was Massey & Wood, Inc., Richmond, with a capital of $100,000.

The Great Valley Anthracite Co., organized to develop hard-coal mines in Virginia, made considerable progress on an extensive acreage in Montgomery and Pulaski counties. The R. W. Shreve farm of 440 acres near Doran was acquired by J. N. Harmon, secretary and representative of the Coal Creek Coal Co. and the Coal Mountain Mining Co., whose lands adjoined the farm. It was announced that the purchasers would build a standard-gage railroad about 2½ miles from Doran up Mud Lick Creek to develop about 10,000 acres of coal land. The Virginia Fuel Corp., of South Norfolk, shipped its first cargo of briquets made from half soft coal and half anthracite slack to England.

In West Virginia last year there were many reports of projected mergers many of which never passed the rumor stage. Among those consummated, however, was the Thurmond Consolidated Coal Co., capitalized at $1,000,000, which absorbed the Argyle Coal Co., Thurmond Coal Co., Logan Eagle Coal Co. and the Perry Branch Coal Co., all controlled by Walter R. Thurmond and his associates. A $7,000,000 company known as the West Virginia Southern Coal Co., headed by Everett Drennen, formerly of the West Virginia Coal & Coke Co., was organized to take over the March Fork Coal Co., Birch Fork Coal Co., Seng Creek Coal Co., Leevale Coal Co., Silush Coal Co., Vanbale Coal Co., Basic Coal Co., Burgess Branch Coal Co. and Siler & Siler, including the sales agency of the last-named company. A bond issue of $1,350,000 was made to help finance the company.

Fred Essex and associates, of Columbus, Ohio, opened a new mine on Whites branch of Little Coal River, Boone County, attaining an output of 6,000 tons per month, though it is expected ultimately to produce 20,000 tons a month. The Mill Creek Coal & Coke Co. acquired the property of the Mill Creek & Elkhorn Coal & Coke Co. and erected a new tipple to take care of the full output. An extensive crushing and screening plant was constructed by the West Virginia Coal & Coke Co. at its Coalton operation.

Modernization work by the Consolidation Coal Co. progressed to such an extent that the company was able to produce as much coal at fifteen plants as nearly twice that number turned out in the past. New tipples were erected by the Davis Colliery Co., at Jontee, and by the C. H. Mead Coal Co., at its No. 2 operation. Plans were perfected by the Superior-Pocahontas Coal Co. to open a new mine at Davy, with an initial expenditure of $65,000 toward developing a 2,300-acre tract. The Portsmouth By-Products Co. erected a $250,000 tipple at its Freeburn mine, raising the loading capacity from 2,500 tons in 12 hours to 4,000 tons in 8 hours. A new tipple and screening outfit costing $50,000 was constructed by the Winding Gulf Colliery Co. Output by the Island Creek Coal Co. was considerably increased by the addition of a shaft mine of its Logan County group. Three substations were installed at its mines near Holden. The company also acquired about 12,000 acres of coal land in Mingo County, on which it was planned to spend more than a million dollars in development, including a townsite.

MODERN TIPPLES ERECTED

Contracts were let by the Pemberton Coal & Coke Co. for the construction of two large steel tipples costing $100,000—one at Big Stick and the other at the Wat-Wise mine — with modern equipment. The Redstone Coal & Coke Co. planned the installation of a coal-loading belt and chute at its mine on the upper Monongahela River. The West Virginia Coal & Coke Co. purchased the Logan Dock Co. at Huntington, substantially increasing its shipping facilities by way of the Ohio River. Extensive improvements were begun by the Westchester Pocahontas Coal Co., of Chicago, at its newly acquired plant near Welch. The tract comprises 1,025 acres of Pocahontas coal and the company expects eventually to produce 25,000 tons monthly.

The newly organized Southern Smokeless Coal Co. acquired the property of the Beury Coal & Coke Co. at Beury, on which it began extensive improvements, including the installation of power and mining machinery. A new four-track steel tipple capable of handling 250 tons an hour was completed by the New River & Pocahontas Consolidated Coal Co. at Kaymoor No. 1 mine. Planning the opening of coal fields in the Wheeling district, the Wheeling Coal Railroad Co. purchased a large acreage in the Panhandle region.

Fifty new houses costing approximately $50,000 were erected by the Nelson Fuel Co. at its plant at Leslie, Greenbrier County. Driving a new opening to the Bakerstown seam at Blazer, three miles east of Tunnelton, the Snider Coal Co. started operations. The old wooden tipple of the Dakota mine of the Bethlehem Mines Corporation was torn down to make way for a modern steel structure. Extensive improvements were begun at two of the mines of the Bertha Consumers Co.—the Rachel, near Mannington, and the Eureka, at Randall—a new river tipple going up at the latter operation. New tipples were erected also by the Kingston Pocahontas Coal Co., West Virginia Eagle Coal Co., at Boncar, Fayette County, and the Hardesty mine, at Shinnston. The Blue Ridge Coal Corporation, built two such structures at Brush Creek, on Coal River.

THREE COMPANIES MERGE

The Blue Ridge Coal Co., Brush Creek, Boone County; Swiss By-Product Coal Co., Nicholas County, and the Export Coal Co., Fayette County, having a combined output of 4,000 tons per day, were consolidated under the name of the Superior Fuel Co., capitalized at $2,500,000. Part of the scheme of the Old Ben Coal Corporation of Chicago, to acquire property in the West Virginia field took shape in its purchase of the Glen Rogers mine of the Raleigh Wyoming Coal Co. The Black Betsey and Otto Marmet Coal Co. properties, in Putnam County, were taken over by the Otto Marmet Coal Mining Co., the original company, with the purpose of consolidating the two properties and making an extensive outlay for improvements. New equipment for the Montcoal mine of the Calcord Coal Co., in Raleigh County, involved the expenditure of $30,000.

At the Nuttallburg mine, Fayette County, the Fordson Coal Co. installed a rope and button conveyor 1,500 ft. long at a cost of $100,000. Foundations for a similar installation 1,200 ft. long were laid by the Webb Coal Co. at the Webb mine, Garrison. The Crozer Coal & Coke Co. installed a preparation plant at Elkhorn having a capacity of 6,000 tons a day. The plant and property of the Wake Forest Mining Co. on Cabin Creek was purchased by the Wyatt Coal Co., which purposed increasing the capacity of 400 tons per day to 1,000 tons. Howard W. Showalter, president of the Continental Coal Co., purchased 1,000 acres of Sewickley coal land in the Scotts Run section for the purpose of increasing the company's capacity of 3,000 tons per day to 4,000.

Putting into effect a scheme determined upon following an explosion at the No. 7 mine of the Jamison Coal & Coke Co., the company bored holes in front of the workings at the No. 8 mine in which vacuum pumps were inserted to draw the gas from the coal to be mined. Air-driven punching machines also were installed to replace electrical-driven cutting machines as an additional safety measure in the same operation. Rock-dusting was adopted at the Rachel mine of the Bertha Consumers Co. and at Federal Nos. 1 and 3 of the New England Fuel & Transportation Co.

During the greater part of 1926 there was a scarcity of mine labor in the entire Georges Creek and Upper Potomac coal fields in western Maryland. In the main, the mines, especially the larger ones, worked steadily.

A considerable acreage of Big Vein coal was worked during the year. Nearly all of this coal had been mined in previous operations, leaving only the pillars and in some instances the bottom and roof coal. The recovery of this coal is difficult and dangerous and yet considerable tonnage is being mined daily from the Big Vein. Two or three of the largest companies are doing noteworthy work in this line.

With the gradual exhaustion of the Big Vein coal the thinner seams are being worked more and more. The most important of the thinner seams is the Tyson or Lower Sewickley, which was mined extensively during the year, largely for steam purposes. The Bakerstown or Four Foot, locally known as Barton coal, also was worked to a considerable extent during the year.

Operations also were carried on in the Bluebaugh, one of the Kittanning seams, and to a limited extent in the Six Foot or Davis Seam.

Use Conveyors in Thin Seams

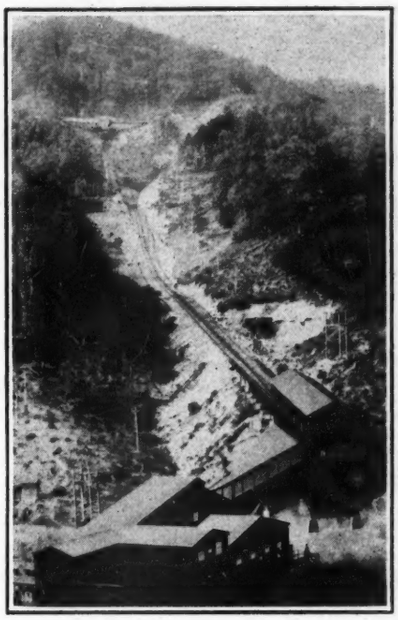
There has been an extension of the use of underground conveyors in the thinner seams of coal and in the region there are now in operation two installations of underground conveyors, one of the pan type and one of the chain type. Both of these are operating in coal averaging less than 3 ft. in thickness. The pan type, furthermore, is operating in coal as thin as 20 in. and apparently is doing so successfully.

The speed of driving entry or headings has been greatly increased by the use of the pan type of conveyor. It has been possible to cut and load out a heading 20 ft. wide, undercut to a depth of 6 ft., two and three times in an eight-hour shift. There has been a steady increase in the number of mines screening coal.

As a whole, the year was better than the two preceding years and the industry seems to be recovering from the serious setback it received during the strike of 1922.

Several new mines were opened in the thinner seams, the equipment in most instances being modern. Improved methods of mining are being tried out in at least four or five mines and important results are expected during the calendar year 1927.

The State Bureau of Mines, the operators and miners co-operated to spread the practice of mine safety. One mine was completely rock-dusted and efforts were made to widen the use of permissible explosives.



Bonny Blue Coal Co., Bonny Blue, Va.

This mine was developed in 1924 under the name of the Blue Diamond Virginia Coal Co. The seam is 1,000 ft. above the railroad track, and is in Little Black Mountain, near St. Charles. The production is over 2,000 tons per day.

In the anthracite field of Pennsylvania work was started on a new breaker at Olyphant for the Hudson Coal Co., costing $2,000,000, electrically equipped throughout and designed to do the work of three older structures. The Coleraine Colliery Co. contracted for the electrification of its new breaker and mines at Coleraine, near Hazleton. A new seam of anthracite 16 ft. thick was discovered by drillers of the Weston Dodson Coal Co. near Hazelton and development was begun, the output to be prepared at Beaver Brook plant. For $1,600,000 the Wheeling Coal Co. sold to the Redstone Coal & Coke Co. 987 acres of virgin coal lands, with all rights, in Luzerne Township. A large new breaker was completed by Madeira, Hill & Co. at Marion Heights.

Erect Huge Wooden Breaker

Plans were drawn up by the Hazle Brook Coal Co. for a new breaker with a daily capacity of 1,000 tons at Tremont. The contract for a new wooden breaker for the same company at Keffers called for 1,000,000 ft. of lumber. Work on the foundation of a $2,000,000 dam for the Hudson Coal Co. was begun at Coal Run. The dam will hold two billion gallons of water, which will be used for the operation of several new collieries in projection for that section. Pardee Brothers & Co., Inc., began work on a new breaker at the Lattimer mines to cost more than $200,000 with machinery.

Placing a mortgage for $2,000,000 with the Hanover National Bank of New York, the Scranton Coal Co. began an improvement program, the chief feature of which was the driving of a tunnel from the Mount Pleasant mine to the Pine Brook mine, upon the completion of which all coal from the former colliery was to be hauled to the Pine Brook breaker for preparation. Operation was started at a new electrically operated breaker at Gowen, not far from Hazleton, by the Buck Mountain Coal Co. Hazleton and Philadelphia interests leased the mine from Coxe Brothers & Co.

John Markle, one of the most prominent independent hard-coal operators, retired from the industry, his interests having been purchased by Alvan Markle, Jr.; Eckley B. Markle and Donald Markle, sons of Alvan Markle, Sr., of Hazleton. A bond issue of $4,000,000 was floated to finance the deal.

Stripping operations on an extensive scale were started on Hosie Mountain back of Archbald by the Archbald Coal Co., which also erected a new breaker. The Lehigh Valley Coal Co. awarded a contract to a Hazleton construction company to strip anthracite measures from its properties between Coleraine and Tresckow. The washery and other holdings of the Barton Coal Co. in the same section were sold to the Scranton Coal Co. for a consideration said to be $100,000.

Prompted by "prostration of the soft-coal business in the Pittsburgh district during the last two years," the Pittsburgh Coal Producers' Association formally dissolved, effective Jan. 1. Wages and freight rates were cited as the chief causes of the depression in the industry.

Cosgrove-Meehan Co. Expands

The Cosgrove-Meehan Coal Corporation acquired the entire holdings of the Dilltown Smokeless Coal Co., in Indiana County, including 1,378 acres of coal lands, mine and equipment and houses for employees, for $575,000. The mine's capacity—1,000 tons daily—was to be increased. Jones & Laughlin completed 122 byproduct ovens at its Aliquippa works, adding 1,800 tons a day to production.

One of the most important coal deals in central Pennsylvania for several years was closed when the Sonman Shaft Coal Mining Co., with holdings in Cambria County, was sold by Thorne, Neale & Co. to A. H. Powell & Co., Inc., of New Haven, Conn. At the time of the sale the company was working three seams and had a capacity of 750,000 tons a year, owning 3,000 acres of coal land. Near Brownsville the Snowdon Coke Co. erected a steel tipple and trestle approach to its plant. The Shannopin Coal Co., a subsidiary of the Jones & Laughlin Steel Co., began development of a new coal field consisting of several thousand acres near Taylortown. The plans called for the opening of two mines, construction of a narrow-gage railway from Taylortown of Poland, three miles distant, building of a dock at Poland and the erection of 250 houses for miners.

Work was started on the second underground haulage system for the H. C. Frick Coke Co., by means of which coal from seven mines will be conveyed to a new loading dock at Palmer. Nearby the Weirton Steel Co. also began the construction of a new coal dock. A federal permit was granted to the Heckle Coal & Coke Co.

to construct four piers, loading boom and support and for structural steel work at the Isabelle mine, Hillkote, Fayette County.

Work on an air cleaning plant with a capacity of 325 tons per hour got under way at the Montour No. 10 mine of the Pittsburgh Coal Co., which also installed shaking conveyors in the Warden and No. 9 mines. The Republic Iron & Steel Co. launched an electrification program at its Republic mines preliminary to replacing its own steam generative current with purchased power. At mine No. 31 of the Berwind-White Coal Mining Co., Windber, was constructed a modern dry cleaning tipple, the largest of its type in the world. It is entirely of steel and has a capacity of 3,000 tons daily.

In March the Indian Creek Valley Mine Drainage Co. started driving a tunnel in the coal to drain the water from the Melcroft, Sagamore and Indian Creek mines to a point below the dam of the Mountain Water Supply Co. The tunnel will extend about 36,000 ft. and will be completed next spring. The Diamond Coal Co. started development of 100 acres of coal land with a new tipple for a mine at Fort Palmer. Approximately $150,000 was spent in electrifying the No. 3 plant of the Oliver & Snyder Steel Co.. at Oliver.

The most important development of the year in Ohio was the organization of the first statewide association of operators, having for its purpose united action in rate, wage and labor matters. It was indicated that the organization might refuse to act with the other three states in the Central Competitive Field in wage negotiations in the future.

PLANTS CHANGE HANDS

The Youghiogheny & Ohio Coal Co. purchased the Progress Coal Co.'s mine at Bannock for $61,163. A large tract of coal land in the Pomeroy Bend distric was bought by the New Pittsburgh Coal Co., a subsidiary of the Pittsburgh Coal Co., for about $100,000. The land had been under lease by the company for some time. The Crab Orchard Mining Co., near Freeport, was taken over by the newly organized Freeport Collieries Co. David Thomas' holdings of 12,000 acres of coal lands at Naugatuck were bought for $300,000 by Columbus interests, who organized the David Thomas Coal Co.

Development of one of the largest mines and the deepest shaft in the state, on a 9,000-acre tract three miles southeast of Cadiz, was started by the Ohio & Pennsylvania Coal Co. The plant was designed to have a capacity of between 7,000 and 8,000 tons a day. A new river plant at Cincinnati for the Hatfield Reliance Coal Co., consisting of a river elevator, tipple and rescreening plant, entailed an outlay of $100,000.

The M. A. Hanna interests purchased the Fairport mine and holdings of the Troll Coal Co., including 825 acres of undeveloped coal land. Construction of a new battery of 40 coal chutes for the Norfolk & Western Ry. was begun at Norwood, a suburb of Cincinnati. Approximately $250,000 was paid by the E. P. Wynn Coal Co., Canton, for the Blue Shaft mines of the Akron Coal Mining Co., about 6 miles from New Philadelphia.

Mural Decoration by Mother Nature

Scene in Mine No. 2 of the St. Louis, Rocky Mountain & Pacific Co., Sugarite, N. M. Shows trees, palm and other leaves and vegetable matter that enter into the formation of coal. Within two miles of this mine is another formation which, instead of vegetable matter, contains petrified sea shells, coral, etc.

Expansion of stripping operations was the outstanding development of an otherwise relatively dull year in Indiana, a number of small shaft operations being compelled to dissolve. The United Electric Coal Cos., the largest operator of strip mines in the Middle West, began shipping from its operation at Farmersburg, Sullivan County, and planned a new development near West Clinton, Vermilion County. A strip pit on a 2,000-acre tract northeast of Brazil was opened by the Maumee Collieries Co. The Mid-Continent Coal Co. acquired 639 acres southwest of the same field with the intention of starting operations promptly, but suddenly transferred its activities to Clinton. A new stripping field was opened by the Ohio & Indiana Coal Co. three miles northeast of Oakland City.

Part of the expansion program of the Cosgrove-Meehan Coal Corporation consisted of the acquisition of three large shaft mines in the Clinton district near Terre Haute, where further development was planned to bring output to 1,000,000 tons annually. The A. D. Spears Coal Co. was organized to take over the property and business of the Vermilion Coal Co., Terre Haute, valued at $550,000. At Somerville, 25 miles north of Evansville, a new mine employing 100 men got under way. Another company formed to operate in this state was the Vandalia Coal Corporation, having 14,128 shares of no par value. Purposing to take over the Schepferman shaft, at Ehrmanndale, the Little Fork Mine Co. was organized and set out to raise output to 1,200 tons daily. Development of a mine at Buckskin, Gibson County, was contemplated by the Big Vein Coal Co., formed for the purpose. Near Boonville, Warrick County, 310 acres was acquired by the Sunlight Coal Co.

There was much rebuilding at coal plants in Indiana last year, it is true, but a large proportion of it was brought about by numerous fires of a suspicious nature during labor troubles in the southern part of the state. It was finally necessary to call out the National Guard to restore order. Aside from this, however, the Indiana Coke & Gas Co. added a battery of coke ovens with byproduct equipment involving an outlay of over $400,000. The Knox Consolidated Coal Co. converted its Westphalia and Indian Creek mines into electrically operated plants. At Arthur, Pike County, the Ayrshire Coal Co. installed a new air cleaning plant at its No. 8 mine at a cost of $100,000.

Not much new development was in evidence in the coal mining industry of Illinois. Two new companies—the Galesburg Mining Co., Galesburg, and the Greenview Mining Co., Greenview—got under way, but neither produced much coal. At least one-third of the mines in the state were idle most of the summer, but nevertheless the tonnage produced, which is estimated between 68,000,000 and 70,000,000 tons, compares favorably with that of any of the preceding five years. Increased working time at the active plants was largely responsible for this showing.

New Orient mine of the Chicago, Wilmington & Franklin Coal Co., West Frankfort, again set a new world's record for output in a single day, with 13,563 tons on Nov. 3. No special preparations were made for this achievement, as 12,025 tons was hoisted on the preceding day and 11,743 tons on the day after the record was made—a total of 37,331 tons in three days.

The value of rock dusting as a safety measure, which is steadily gaining recognition in this state, was strongly manifested in an explosion at the New Orient mine on Jan. 29. Though there were 1,235 men in the mine when a bratticeman attempted to relight his lamp with a match while gas was escaping, only five men were killed.

NEW SHAFT SUNK

Indications point to an output by Kansas mines in 1926 of about half a million tons more than in the preceding year. The Western Coal & Mining Co. sunk a new mine—No. 22—at Arma, equipped with a large electric hoist, steel tipple and fan of steel construction. The operation is modern throughout and is intended to be one of the largest in the state. In Cherokee County the Pittsburg Coal Co. sunk a shaft last summer and an electric hoist and cutting machine are now at work. The output of this operation will be between 700 and 800 tons per day. Another mine, known as No. 24 Western, now being sunk, will be among the big producers for this field.

Quite a number of mines that had been closed down reopened during the year, among them No. 16 of the Jackson-Walker Coal Co., which put about 100 men at work after over three years' idleness. No. 19 of the Clemens Coal Co., with the entries all straightened out and reconditioned, is being oper-

ated by Hal Cowen. No. 3 of the Domestic Coal Co. was reopened by George T. McGrath, who also installed undercutting machines.

Four power shovels—two electric and two steam—installed in the top seam played an important part in production during the year. It is probable that during the present year there will be some development of deep mines, with even larger output than in the year just ended.

Rock-dusting has been adopted at the following mines: Western No. 22, Wilbert-Schreeb No. 3, Oberzan Coal Co., Hamilton Coal Co. No. 6, and No. 17 of the Frontenac-Pittsburg Coal Co. Preparations also are being made to adopt the practice at mine No. 16 of the Jackson-Walker company, now being operated by the Fulton Coal Co.

Buyers and Lessees Busy

In Missouri the Western Coal & Mining Co. hoisted its first coal from the new No. 2 mine, near Minden. Howard & Sons subleased a coal property near Salisbury from R. E. Davis and sank a 150-ft. shaft to mine a 4-ft. seam. James T. O'Hara, of Bowie County, Texas, leased a large tract of land north of Kirksville, with the purpose of developing a coal field. Evan Jones and E. A. Marriott, of Moberly, closed a deal for 400 acres of coal land for a stripping operation; the consideration was close to $30,000. Steady progress was made on the stripping project of the Howard County Mining Co. near Higbee.

In Iowa the Clean Coal Co., Gravity, began work on a new double shaft about 150 ft. south of the shaft previously in use. The new shaft was to be used for hoisting coal and the old single opening as an airshaft. Oscar Billberg and associates planned a new mine in the Centerville field a short distance from the Sunshine mine. O. P. Herrick, head of the Flint Brick & Coal Co., closed a lease on the coal rights under more than 700 acres just north of city limits of Des Moines. Plans were announced for increasing the capacity to 1,000 tons daily. Notable progress was made at the Eldora mine, with two shifts at work sinking a shaft 125 ft., at which depth a good seam of coal was located.

Among the new companies organized in Oklahoma in 1926 were the Garland Coal & Mining Co., McAlester, with a capital of $200,000; S. Doyel Coal Co., Henryetta, $20,000; Magnolia Coal Co., Poteau, $15,000; Imperial Coal Co., Muskogee, $50,000; Globe Coal Co., Muskogee, $25,000, and the Missing Link Coal Co., Henryetta. Earl Wells and Frank Barrow, Henryetta, acquired the Sorrels coal mines, at Poteau, with the purpose of developing them.

Though no new mines were opened in Colorado last year, coal output totaled 10,483,464 tons, an increase of 43,077 tons over the preceding year. The Barber Coal Co. finished a new tipple and outside buildings at its mine south of Alamo, and contracts were let for the construction of 21 new houses. A new preparation plant was installed by the Royal Fuel Co.'s Royal mine, in the Aguilar district. The new equipment included the latest type picking table screens, reciprocating feeds, loading booms, storage bins and belt conveyors. Surveys for an electric line seven miles long from Hayden to the Fleet Cat properties on Dry Creek were made. P. M. Peltier and John Connell disposed of the Bear River coal property in Routt County for $375,000 and organized the Keystone Coal Mining Co., with headquarters in Denver and a mine at Oak Creek, in Routt County. About $75,000 was set aside for tipple and mechanical improvements.

The State Supreme Court upheld the state coal mine law affecting about one hundred small mines not served by railroads and hampered by limited finances in fully complying with the provisions enacted by the Legislature.

Early in the year the Sevier Valley Coal Co., Richfield, Utah, determined to push development work on its Salina Canyon properties, where a shaft was being sunk through solid rock. Branch lines were being constructed to the mines. The Consumers Mutual Coal Co. awarded a contract for a new tipple at its mine in Carbon County, the plant to have a capacity of 4,000 tons in eight hours. The Columbia Steel Corporation acquired 116 acres of land to extend its coal operations.

Directors of the Union Pacific Coal Co. adopted a budget providing for the expenditure of $359,904 for new buildings and machinery at its operations in Wyoming during the year. One of the chief improvements contemplated was the erection of a new building in Rock Springs to house all the general offices of the company, which had been in three buildings.

Development in Montana last year was confined largely to a few small properties in Cascade County operated by S. W. Gebo, a pioneer operater in this state. Due to the increasing use of oil-burning engines on the Northern Pacific R.R. the company will close down some of its old mines in Stockett. The same company's strip mine near Forsyth produced 750,000 tons in the last fiscal year.

The Round-Up Coal Mining Co., in Musselshell County, has introduced an entry-cutting and loading machine in the Carpenter Creek mine—the first of its kind to be used in the state—and it is giving satisfaction. At Red Lodge the Northwestern Improvement Coal Co., a subsidiary of the Northern Pacific R.R., has adopted rock-dusting, and it is expected that other companies will follow its lead.

Idaho Mines Being Developed

Idaho's two coal enterprises are still in the early stage of development. The Superior Coal Mining Co., in Teton County, employed only a few men throughout the year, largely in prospecting. The Teton Coal Co., in the same county, completed a 4,800-ft. crosscut and then raised on its coal beds a distance of approximately 500 ft. to the surface. Neither company, however, has a plant to speak of and neither shipped a quantity of coal worthy of mention.

Coal production in Washington in 1926 fell slightly below the 1925 total of 2,522,983 tons. Hydro-electric power and fuel oil have replaced coal in this state to a marked extent, as the falling off in coal output from 4,002,759 tons in 1917 attests. However, the Northwestern Improvement Co. is preparing to reopen its No. 3 mine, which was closed down more than three years ago. This action is in anticipation of the early working out of Nos. 6 and 8.

The Pacific Coast Coal Co. acquired the West Coast mine, at Cedar Mountain, and pushed development vigorously, installing a cleaning plant, electric hoist, airway and fan. At the Black Diamond operation three seams have been tapped and a modern cleaning, preparation and assorting plant installed. A new mine is being opened at Tiger Mountain by the Caroline Coal Co. and modern preparation facilities are being provided.

The Bellingham Coal Co. drove a new slope which increased hoisting capacity about one-third, and erected a new machine shop, blacksmith shop, lamp house, supply house and a modern wash and change house for employees. The Fairfax mine, acquired by the Wilkeson Coal & Coke Co., was the scene of activity in cutting cross-cut tunnels from the old mine into the seams formerly worked by the Montezuma Coal Co. A modern briquetting plant also was erected. The Roslyn-Cascade Coal Co. added an undercutting longwall machine to its equipment and the Bucoda Coal Co. also installed a longwall machine.

To Develop California Mines

Despite the strangle hold of hydroelectric plants and fuel oil on California power and heat consumers a $10,000,000 coal corporation—the Mt. Shasta Coal Co.—was organized to mine coal in Shasta County. The company acquired 15,000 acres in the Oak Run and Round Mountain districts and for several months extensive development work was carried on along Clover Creek and Oak run, 25 miles north of Redding.

Production of coal in Alaska in 1926 was maintained at approximately the same rate as heretofore and was furnished mainly by the Evan Jones, Alaska Matanuska and Premier mines, in the Matanuska region, and the Suntrana mine, in the Healy River field. The Alaska Matanuska was more or less completely closed down for several months during the summer for the purpose of installing new machinery and getting the washing plant into running order. With the completion of this work it materially increased its production in September, and it probably has maintained an even higher output for the last quarter of the year, as it has one of the largest contracts with the railroad for coal.

The legal difficulties of the Premier mine have been solved sufficiently so that it continued to produce a small amount of coal. Some development work under lease or permit also was done at the Rawson mine, on Moose Creek, and on Coal Creek opposite Chickaloon. The Healy River Coal Co.'s mine was in operation throughout the year, though its production during part of the summer was reduced while certain construction work was in progress.

Interest in the Bering River field was revived during the year, but no productive mining was in progress. A little

coal is reported to have been mined from the Chicago Creek mine, in Seward Penninsula. A small amount of coal was dug by natives for local use from coal beds exposed near Wainwright, and applications were filed for coal-prospecting permits covering several other areas in northern Alaska.

The controlling factor of Alaskan coal production continues to be the market, and special efforts have been made by several of the companies during the year to build up an outlet for their coal. As a result of these efforts, shipments have been made to several points as far distant as southeastern Alaska, but the largest quantity of coal continues to be used on the Alaksa R.R. and in enterprises in the immediate vicinity of the railroad.

Fear of Coal Shortage Spurs Development in Canada

By S. J. Cook

Chief of the Mining, Metallurgical and Chemical Branch, Dominion Bureau of Statistics, Ottawa, Canada

PROBABLY NO SUBJECT presents a problem of greater general public interest in Canada just now than the topic of fuel supply. Two main causes have brought about this effect: limitation of supplies from other countries, and a growing national appreciation of the value and extent of Canada's own coal resources.

Repeated shortages of coal supplies caused a widespread popular demand for the adoption of measures to prevent the recurrence of such situations. As a result, steps were taken to promote the byproduct coking of Canadian coal to meet the need for domestic fuel; investigations were undertaken looking to the preparation of Western lignites in such form as would permit their shipment for considerable distances; oil-burning equipment suitable for household heating made its appearance on the Canadian market; and, as a by-product of the educational program regarding household fuels, there arose a demand for the more extensive use of Canadian coals by railways and industrial concerns.

EMPLOYMENT STAGES COMEBACK

Employment in coal mines at the beginning of the year stood at a lower level than it did at the beginning of either 1925 or 1924; during the early months it dropped still farther down, but in June an upward trend set in which soon carried the index of employment above the 1925 curve, the rise continuing until it passed the 1924 mark in October, and continued its upward way in November.

Nova Scotia tonnages began to rise earlier in the year than those of the other provinces, thus serving to counteract the general industrial depression so noticeable in the provinces by the sea. Employment turned upward in April and maintained the trend throughout the remaining months of the year. The output, it is gratifying to note, rose at a somewhat greater rate, indicating increased efficiency in operation.

Alberta coal mine operations showed a steady seasonal downward trend from January to April. From May until the end of the year, there was a steady advance, both in employment and output. Political situations in Ontario and the Dominion, furnished opportunities for the revival of the proposal to ship Alberta coal to Ontario, and conferences, press notices, editorials, and many campaign speeches, served to stir up public interest in this regard. Toward the close of the year, Western operators inaugurated a determined campaign to promote the sale of Canadian coal within the confines of the Dominion.

British Columbia ran its quiet way—employment declined but the output of coal showed a gradual increase, during the year. Lying to the west of the Rockies, the coal trade of British Columbia is not subject to the same vicissitudes which beset its Eastern neighbors, but the increasing use of imported fuel oil in this province is a matter of very serious moment to the coal mining industry.

Investment in coal mining in Canada, including the cost of properties, the value of inventories, and each value of mining accounts, averages about $138,000,000 annually. Nova Scotia and Alberta share about equally at upward of $50,000,000 each; British Columbia comes next at $33,000,000; Saskatchewan, $3,000,000 and New Brunswick $2,000,000, respectively. In Canada there are about 500 coal mines in operation, of which number, four-fifths are located in Alberta and Saskatchewan.

Canadian coal mines in 1926 produced upward of 77 per cent of the possible tonnage, during operating periods, excluding general strikes. Loss of time due to strikes totalled only about 40,000 man-days as against more than 1,570,000 man-days lost in 1925.

Technical Progress in British Mining Affected by Suspension

By Hubert Greenwald,

Editor, *Colliery Guardian*, London, England

Royal Commission report at variance with owners' efforts to revive industry through cut in production cost. Mergers made for economy in power supply, mining and transportation

TWO EVENTS, intimately related in their origin, had a profound influence upon technical progress in the British coal mining industry during 1926. These were the publication in February of the report of the Royal Commission on the Coal Industry and the subsequent general stoppage of the coal mines. The latter was ushered in on May 1 by a spectacular general strike which lasted only a few days, but the coal stoppage was prolonged for seven difficult months. The cost has been variously estimated between £200,000,000 and £350,000,000 and the greater portion of the burden will be felt in the present year.

STRIKE COSTS ENORMOUS

The net result, from the standpoint of fuel supply, is that the nation has been compelled to curtail its consumption of solid fuel by some 75 million tons—from 189½ to 115 million tons. Including 92 million tons raised in the first four months of the year, the total output in 1926 amounted to about 125 million tons. To meet this deficit upwards of 19 million tons were imported, mainly from the Ruhr, Upper Silesia and America—and there has been a decline in exports of about 40 million tons— from 71½ to 31 million tons. The cost of preserving the collieries from the effects of disuse during the strikes has been not less than fifteen millions.

The settlements which have followed upon the breakdown of the strike through disintegration and exhaustion constitute a signal victory for the employers. Not only have the coal owners obtained the substitution of district arrangements for an uneconomic national agreement, and to a large extent destroyed the power as an entity of the Miners' Federation of Great Britain, which in recent years had been increasingly exerted towards the furtherance of political objects, but they have also secured appreciable reductions in the minimum wage rates and an extension of hours varying 30 to 60 min. per working shift. (In the direction last named they were assisted by a permissive act, passed by Parliament at midsummer, repealing the Seven Hours Act passed at the instance of the Sankey Commission, whose forecasts have so egregiously miscarried.)

MINERS ASK HOSTAGE

In respect both of district agreements and of the increase of the shift, the coal owners were in direct conflict with the Samuel Commission. Their main contention was that the Commission took too sanguine a view of the financial gap that had to be bridged in order to restore the solvency of the industry and of the material value of the reforms advocated in the report. But the real clash arose on a question of principle; whereas the Commission considered that efforts could and should be made to increase the market value of coal, the mine owners held that a revival of the industry could be best secured by a considerable cut in the unit cost of production.

This radical difference of opinion did much to prolong the struggle, for, while the owners insisted upon the adoption without delay of those meas-

ures which were calculated to produce immediate economies, the miners asked for hostages before they would consent to any sacrifices in wages and proposed that in the probationary period there should be a continuance of state assistance, against which the Commission had animadverted in the strongest possible terms.

Both the strike and its sequal have affected the prosecution of the Commission's ideals. State purchase of royalties has had to be dropped, ostensibly on financial grounds, and is not likely to be revived by the present holders of political power. The Commission recommended vigorously the amalgamation of collieries into larger units and the Mining Industry Act, passed Aug. 4, 1926, contains provisions for bringing about changes in this direction on a voluntary basis; at a later date the majority report of the departmental committee on co-operative selling in the coal mining industry went further and advocated as part of its plan for organized marketing the enactment of compulsory powers to enforce district organizations. Nothing is likely to result from this recommendation, which is countered by an effective minority report, signed by the coal owners on the committee.

FROWN ON MUNICIPAL COAL YARDS

The Commission's desire for a closer connection of mining with the allied industries has been partially met by the appointment of a National Fuel and Power Committee. To overcome the difficulties that frequently arise in transport and to promote the use of larger wagons, the Commission urged that a standing joint committee of the Ministry of Transport and the Mines Department should be formed, and this is now being done. The government, however, has refused to legislate power to municipalities to engage in the retail sale of coal.

The Mining Industry Act carried out certain minor recommendations of the Commission in regard to the provision of pithead baths, recruitment of miners, profit sharing and pit committees. There are other proposals which are either not possible at the present time or are to be consummated by evolutionary rather than by legislative development. Just now there is a decided aversion to any increase of governmental interference in an industry that attributes most of its troubles to this source.

Although the British industry was virtually at a standstill during the greater part of 1926, a certain amount of development work has been carried out. This has been helped by the wiser attitude on this occasion of the workman who recalled the follies of 1921, when the safety men were called out and many mines were flooded.

Considerable progress has been made with the sinking and equipment of new pits in East Nottingham and Kent. The first named area bids fair to be the future center of the British coal industry and it is in these two activities that employment may be found for some of the many workmen who for the time being have been banished from the industry. During the stoppage the output capacity of several of the large collieries in South Yorkshire, North Derbyshire and East Nottingham and Kent have been enlarged, whilst improved machinery for the handling and preparation of coal has been introduced and the interconnection of power stations has also been extended.

MERGERS IN STYLE

It is interesting to note that the numerous amalgamations of properties that have been carried out within recent months, notably in South Yorkshire—and which may be followed by others—have had as their principal aim economies in power supply and a concentration of the means of production and transport, rather than a domination of markets. The development of the colliery power system is a corrollary of the national scheme for a "grid" distribution from selected stations which finds expression in the Controversial Electricity Supply Act passed in the last session of Parliament. It also connotes an increased attention to conservation and the utilization of waste heat and power; several collieries are now burning powdered fuel under their boilers and the investigations in regard to low-temperature carbonization are being actively supported by the mine owners.

In regard to changes in working methods the year has naturally been unfertile. A good deal of attention, however, has been directed to the progress of mechanical loading in America. In Great Britain the comparative thinness of the seams, the relative cheapness of manual labor, the greater thickness of overburden, and the more urgent necessity for a clean output product accentuate the difficulties with which such machinery has had to contend in the United States. But there is an increasing tendency to co-ordinate production and underground transport by the co-operation of machine mining and conveyors, and the arcwall coal cutter has gained fresh adherents, although some collieries lean toward the use of the mechanical pick or *marteau préquer*, the application of which has extended so rapidly on the Continent in recent years.

PLAN MACHINERY INVESTMENTS

It is no part of the British coal owners' policy to curtail output, systematically or otherwise, and the wages of the 250,000 workmen, whose labor has been dispensed with, will largely be invested in machinery. In this connection it is important to observe that the new district agreements, although they provide for longer working hours —increasing thereby the profitable use of mechanical plant—have registered in certain cases an alteration of the profits-wages ratio from 13.87 in the 1924 agreement to 15.85—to provide an increased emolument for new capital developments. The Scottish agreement specifically states that the district board shall examine capital expenditures in relation to their effect upon wages. The South Wales agreement stipulates for the unimpeded introduction of double-shifting and machinery —a proviso necessitated by the spasmodic opposition in the past against the use of underground conveyors.

Limitations of space prevent discussion at length of the subject of research in its bearing upon mining problems. The benefits of the co-operation between the Safety in Mines Research Board and the Bureau of Mines are being generally recognized in this country. The transfer of the large testing gallery from Eskmeals to a new site in Derbyshire has precluded large-scale work, but a great deal of detailed research has been conducted in connection with the use of blasting explosives, electrical plant, and the constitution of coal. The latter subject, which has an important bearing upon the problems of spontaneous combustion has now been clarified considerably by the recent researches of Professor Wheeler and his associates. Much attention continues to be paid to the standardization of colliery material and during the year specifications were issued dealing with light colliery rails and arches.

In conclusion it may be said that the year 1926, with all its disasters, has had a chastening if enervating effect and the British coal industry rises from its sick bed with increased determination to face with a stiff lip the formidable struggles that undeniably await it in the new year.

Electrify Reclaimed Mines in France; No New Seams

No new borings of virgin land for coal took place in France during the year nor were there any mine reopenings of consequence, events of the latter class being confined to a few operations in the Centre which, though difficult to work, were able to resume activities because of high selling prices.

Reconstruction of the devastated collieries of the Nord and Pas-de-Calais is virtually complete. The equipment is modern throughout and includes electrification. Most of the pits have cages capable of lowering 30 men at a time into the pits. The props are either of metal or concrete. At the beginning of the year there were 16,800 pickhammers and 7,200 borehammers in this field. The number of colliery employees in this region last year was 195,000, compared with 181,000 in the preceding year and 133,800 in 1913.

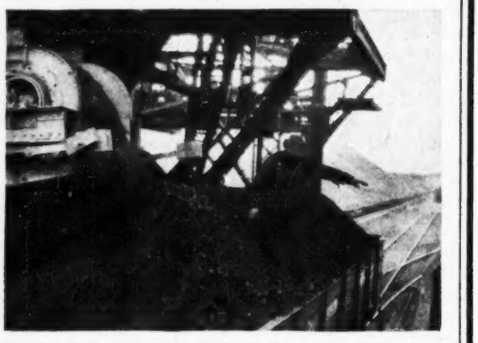
Several companies have begun the manufacture of synthetic ammonia, methyl alcohol and other byproducts.

Development On Small Scale In Belgian Coal Fields

Except for operations on a small scale in the Campine Basin, no new discoveries of coal measures were made in Belgium during the past year and no new borings were undertaken. In the trying period preceding the outbreak of the strike of British miners the market was in such a state of depression that some of the collieries with unfavorable natural conditions were forced to close, and when the flurry came they were unable to resume because of a shortage of money and labor. Operations continued in the Campine Basin, however, the latest figures indicating an output of about 30,000 tons.

MARKET REVIEWS

Trends, Production and Prices in Principal Fields of United States—Outstanding Foreign Developments



Large Volume Business Marks Trade In American Coal Industry in 1926

By Sidney A. Hale
Associate Editor, *Coal Age*

Bituminous production close to record last year at prices approximating 1918 average. Anthracite stages quick come-back after prolonged suspension.

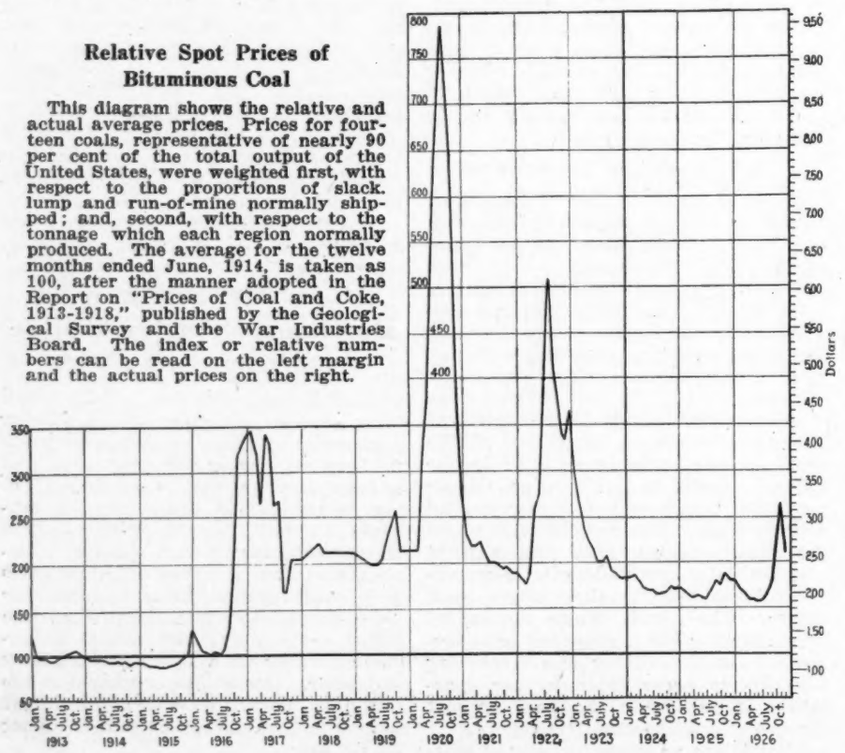
IN A COUNTRY where volume of production is one of the most widely accepted criteria of success the record of the coal industry of the United States in 1926 cannot be characterized as unsatisfactory. The bituminous division of the trade broke all postwar figures for annual output and came perilously close to exceeding the maximum tonnage mined in 1918. Although hampered by a strike which shut off production during the first six weeks of the year, the anthracite collieries were operated at a high rate until towards the close of the year.

From the standpoint of volume of gross sales the industry also gave a good account of itself. Available data indicate that the producers last year received approximately one and three-quarter billion dollars for their coal. While this is no inconsequential sum, it is, roughly, only about $100,000,000 more than the returns in 1921 when the total production was approximately 157,000,000 tons less. Compared with 1920, when production was approximately 5,000,000 tons less, the receipts last year represented a shrinkage of $750,000,000.

During the past year the total demand for bituminous coal was almost equal to that in 1918. There was no artificial control of prices by government or unofficial authority. In the course of the twelvemonth the soft-coal operators were called upon to meet two extraordinary situations. Early in the year they were required to make up a large part of the deficit in domestic coal created by the protracted anthracite strike. Later in the season the vacuum in world supply arising out of the seven months' suspension of production in Great Britain was relieved in no small

Relative Spot Prices of Bituminous Coal

This diagram shows the relative and actual average prices. Prices for fourteen coals, representative of nearly 90 per cent of the total output of the United States, were weighted first, with respect to the proportions of slack, lump and run-of-mine normally shipped; and, second, with respect to the tonnage which each region normally produced. The average for the twelve months ended June, 1914, is taken as 100, after the manner adopted in the Report on "Prices of Coal and Coke, 1913-1918," published by the Geological Survey and the War Industries Board. The index or relative numbers can be read on the left margin and the actual prices on the right.



Bituminous Coal Production, Spot Prices and Index By Weeks, 1926

Week Ended	Production (Net Tons)	Week Ended	Average Spot Price	Coal Age Index
Jan. 2	10,667,000	Jan. 4	$2.19	181
Jan. 9	13,031,000	Jan. 11	2.18	180
Jan. 16	13,069,000	Jan. 18	2.19	181
Jan. 23	12,431,000	Jan. 25	2.16	178
Jan. 30	12,563,000	Feb. 1	2.16	178
Feb. 6	12,167,000	Feb. 8	2.14	177
Feb. 13	12,011,000	Feb. 15	2.10	173
Feb. 20	11,509,000	Feb. 22	2.06	170
Feb. 27	10,890,000	Mar. 1	2.04	169
Mar. 6	10,460,000	Mar. 8	2.02	167
Mar. 13	10,690,000	Mar. 15	2.03	168
Mar. 20	10,263,000	Mar. 22	2.02	167
Mar. 27	9,626,000	Mar. 29	1.97	163
April 3	9,040,000	April 5	1.93	160
April 10	9,420,000	April 12	1.91	158
April 17	9,306,000	April 19	1.92	168
April 24	9,271,000	April 26	1.93	159
May 1	9,125,000	May 3	1.92	159
May 8	9,039,000	May 10	1.95	161
May 15	9,299,000	May 17	1.93	159
May 22	9,282,000	May 24	1.89	157
May 29	9,683,000	May 31	1.94	160
June 5	9,660,000	June 7	1.90	157
June 12	9,624,000	June 14	1.89	156
June 19	9,503,000	June 21	1.90	157
June 26	9,846,000	June 28	1.90	157
July 3	9,490,000	July 5	1.91	158
July 10	8,306,000	July 12	1.91	158
July 17	10,116,000	July 10	1.90	157
July 24	10,150,000	July 26	1.92	159
July 31	10,540,000	Aug. 2	1.92	159
Aug. 7	10,150,000	Aug. 9	1.96	162
Aug. 14	10,628,000	Aug. 16	1.99	164
Aug. 21	10,533,000	Aug. 23	2.00	165
Aug. 27	11,217,000	Aug. 30	2.04	168
Sept. 4	11,015,000	Sept. 4	2.07	171
Sept. 11	10,257,000	Sept. 13	2.13	176
Sept. 18	11,447,000	Sept. 20	2.19	181
Sept. 25	11,717,000	Sept. 27	2.22	183
Oct. 2	12,008,000	Oct. 4	2.27	188
Oct. 9	12,363,000	Oct. 11	2.33	192
Oct. 16	12,386,000	Oct. 18	2.45	202
Oct. 23	12,712,000	Oct. 25	3.02	249
Oct. 30	13,486,000	Nov. 1	3.45	285
Nov. 6	13,104,000	Nov. 8	3.61	299
Nov. 13	13,807,000	Nov. 15	3.32	275
Nov. 20	14,282,000	Nov. 22	2.94	243
Nov. 27	13,413,000	Nov. 29	2.89	239
Dec. 4	14,676,000	Dec. 6	2.73	226
Dec. 11	14,090,000	Dec. 13	2.59	214
Dec. 18	13,477,000	Dec. 20	2.42	200
Dec. 25	10,406,000	Dec. 27	2.40	198

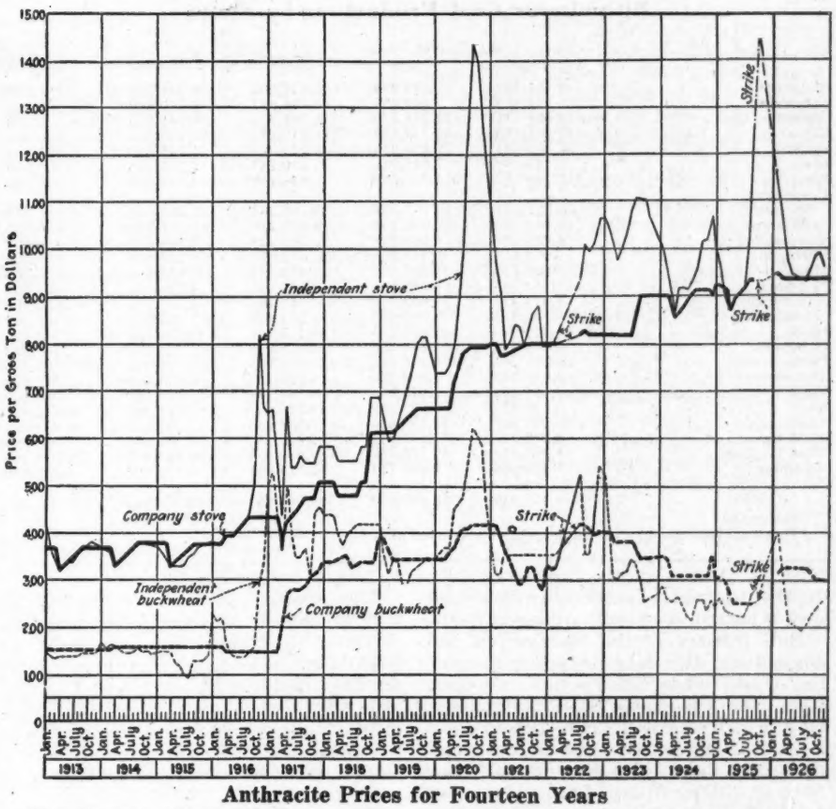
degree by shipments of American coal.

It is true, of course, that both these crises brought about temporary increases in the spot prices realized on the sale of coal produced by the operators in the United States. But at no time did the prices in the open market come within hailing distance of the maximum figures recorded in 1920. The significant fact remains that, despite a higher wage scale in the unionized parts of the bituminous fields than was in effect during the war period, coal was available to the consumers at approximately war levels.

The most recent government estimates place the total bituminous output last year at 578,290,000 net tons. This total was 58,240,000 tons greater than the output in 1925. Increased exports and the sale of bituminous coal as a substitute for anthracite in the early weeks of the year account for about one-half this increase. The rest was absorbed in greater consumption and in the building up of reserve stocks in the hands of the steam consumers and the retail dealers.

During the year weekly output ranged from a low point of 8,306,000 tons in the week ended July 10 to a maximum of 14,676,000 tons in the week ended Dec. 4. Seven times in eight weeks output exceeded the old record of 13,344,000 tons, hung up the week preceding the start of the 1919 general strike, and three times in four weeks the total passed 14,000,000 tons.

Output as a whole, however, lacked the sustained rhythm which characterized 1923. The rhythm was more reminiscent of the seasonal fluctuations which marked normal movement in the prewar years. But these two distinctions should be noted. There were practically no transportation difficulties to quicken buying interest. On the other hand, when the upswing did start, it was accentuated by the heavy shipments of coal overseas.



Anthracite Prices for Fourteen Years

This diagram shows in dollars per gross ton the average company circular price and average spot quotations on "independent" stove and No. 1 buckwheat, f.o.b. mine basis, as quoted on the New York market.

As is set out in detail in the summary table headed "Bituminous Coal Production, Spot Prices and Index by Weeks," appearing on p. 156, output passed the 13,000,000-ton level in the second week of January, increased slightly the following week and then began a downward movement which carried it from 12,563,000 tons the last week of that month to 9,626,000 tons in the week ended March 27. Between that period and July 3 production was fairly steady, ranging between 9,039,000 and 9,846,000 tons.

Following a sharp decrease during the week of July 10, production jumped to 10,116,000 tons in the week of July 17 and continued to climb upward, with minor fluctuations, for the rest of the year. The 11,000,000-ton mark was passed in the week of Aug. 27; the 12,000,000-ton level was left behind at the beginning of October and before that month was over weekly output was well above 13,000,000 tons. November production, estimated at 59,721,000 tons, was the largest monthly total in the history of the industry. December figures showed only a small decline.

The reactions which followed the resumption of work at the anthracite mines were unhealthy for the bituminous industry. Thousands of cars of coal rushed forward to Eastern markets for sale as domestic fuel were sold at a sacrifice. To add to the woes of the producers who had enjoyed the Eastern demand during the hard-coal strike period the lake season was slow in getting under way and there were the usual bickerings over prices which should prevail on lake contracts. Much

Average Spot Prices of Bituminous Coal, F.o.b. Mines

(Unit, net ton of 2,000 lb.)

Month	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
January....	$1.46	$1.21	$1.13	$1.53	$4.15	$2.48	$2.57	$2.57	$3.26	$2.25	$4.38	$2.21	$2.10	$2.18
February...	1.22	1.16	1.12	1.40	4.18	2.53	2.49	2.58	2.77	2.20	3.59	2.25	2.04	2.09
March.....	1.17	1.17	1.09	1.27	3.89	2.58	2.47	2.58	2.63	2.12	3.20	2.15	1.99	2.01
April.....	1.17	1.16	1.08	1.24	3.21	2.64	2.43	3.85	2.62	2.24	2.84	2.07	1.95	1.92
May.....	1.15	1.16	1.07	1.21	4.14	2.67	2.38	4.59	2.68	3.11	2.68	2.04	1.97	1.93
June.....	1.14	1.12	1.07	1.26	4.00	2.57	2.40	7.18	2.52	3.32	2.56	2.03	1.95	1.90
July.....	1.18	1.12	1.05	1.22	3.17	2.58	2.47	8.24	2.40	4.67	2.40	1.98	1.93	1.91
August.....	1.22	1.13	1.07	1.30	3.24	2.58	2.76	9.51	2.42	6.13	2.39	1.99	2.04	2.00
September..	1.23	1.11	1.10	1.57	2.02	2.58	2.91	8.52	2.37	5.58	2.46	2.02	2.18	2.15
October....	1.29	1.13	1.12	2.26	2.02	2.58	3.09	7.78	2.33	4.48	2.28	2.10	2.13	2.70
November..	1.31	1.10	1.17	3.87	2.48	2.58	2.57	5.87	2.35	4.11	2.25	2.06	2.26	3.19
December..	1.26	1.11	1.33	4.01	2.48	2.58	2.58	4.38	2.26	4.05	2.18	2.06	2.19	2.53
1st Quarter.	$1.28	$1.18	$1.11	$1.40	$4.07	$2.53	$2.51	$2.58	$2.89	$2.19	$3.72	$2.20	$2.04	$2.09
2nd Quarter	1.15	1.15	1.07	1.24	3.78	2.63	2.40	5.20	2.61	2.64	2.69	2.04	1.96	1.92
3d Quarter..	1.21	1.12	1.07	1.36	2.81	2.58	2.71	8.76	2.40	5.46	2.42	2.00	2.05	2.02
4th Quarter.	1.29	1.11	1.21	3.38	2.33	2.58	2.74	6.01	2.31	4.21	2.23	2.07	2.19	2.81
Yearly aver.	$1.23	$1.14	$1.12	$1.85	$3.25	$2.58	$2.59	$5.64	$2.55	$3.67	$2.77	$2.08	$2.06	$2.21

Relative Prices of Bituminous Coal

(Spot prices July, 1913–June, 1914, as base)

Month	1913	1914	1915	1916	1917	1918	1919	1920	1921	1922	1923	1924	1925	1926
January.....	120	100	93	126	343	205	213	212	270	186	362	183	173	180
February....	101	96	92	116	346	209	206	213	229	182	297	186	168	172
March.....	97	96	90	105	321	214	204	213	217	175	264	178	165	166
April.....	97	96	89	103	265	218	200	318	217	185	235	171	161	159
May.....	95	96	89	100	342	221	197	379	222	257	221	169	162	159
June.....	95	93	88	104	331	212	198	593	208	274	212	167	161	157
July.....	97	93	87	101	262	213	204	681	198	386	198	163	160	158
August.....	100	93	88	107	268	213	228	786	200	507	198	164	166	165
September...	102	92	91	130	167	213	241	704	196	461	203	167	179	178
October.....	106	93	93	187	167	213	256	643	193	370	188	174	176	223
November...	108	91	97	320	205	213	212	485	194	340	186	170	187	264
December...	104	92	110	332	205	213	213	362	187	335	180	170	181	209
1st Quarter..	106	97	92	116	337	209	208	213	239	181	307	182	169	173
2nd Quarter.	96	95	89	102	313	217	198	430	216	218	222	169	162	158
3d Quarter...	100	93	89	113	232	213	224	723	198	451	200	165	168	167
4th Quarter..	106	92	97	280	192	213	227	497	191	348	184	171	181	232
Yearly average	102	94	91	152	269	213	214	466	211	303	226	172	170	182

Bituminous Coal Production by States

(In Net Tons)

	1918	1920	1923	1925*	1926*
Alabama	19,184,962	16,294,099	20,457,000	20,004,000	22,354,000
Arkansas	2,227,369	2,103,596	1,296,892	1,220,000	1,720,000
Colorado	12,407,571	12,278,225	10,346,218	10,311,000	10,428,000
Illinois	89,291,105	88,724,893	79,310,075	66,909,000	69,029,000
Indiana	30,678,634	29,350,585	26,229,099	21,225,000	22,881,000
Iowa	8,192,195	7,813,916	5,710,735	4,715,000	5,362,000
Kansas	7,561,947	5,926,408	4,443,149	4,524,000	4,530,000
Kentucky:					
Eastern	20,723,023	24,492,504	33,780,553	42,882,000	47,916,000
Western	10,798,690	11,036,258	10,890,279	12,187,000	15,469,000
Maryland	4,497,297	4,065,239	2,285,926	2,695,000	3,480,000
Michigan	1,464,818	1,489,765	1,172,075	808,000	651,000
Missouri	5,667,730	5,369,565	3,403,151	2,695,000	2,696,000
Montana	4,532,505	4,413,866	3,147,678	3,044,000	2,617,000
New Mexico	4,023,239	3,683,440	2,915,173	2,557,000	2,880,000
North Dakota	719,733	948,625	1,385,400	1,325,000	1,163,000
Ohio	45,812,943	45,878,191	40,546,443	28,034,000	29,140,000
Oklahoma	4,813,447	4,849,288	2,885,038	2,326,000	2,237,000
Pennsylvania	178,550,741	170,607,847	171,879,913	136,928,000	151,105,000
Tennessee	6,831,048	6,642,428	6,040,268	5,454,000	5,891,000
Texas	2,261,135	1,615,015	1,187,329	1,008,000	1,066,000
Utah	5,136,825	6,005,199	4,720,217	4,690,000	4,428,000
Virginia	10,289,808	11,378,606	11,761,643	12,800,000	13,473,000
Washington	4,082,212	3,757,093	2,926,392	2,538,000	2,551,000
West Virginia	89,935,839	89,970,707	107,899,941	122,381,000	148,014,000
Wyoming	9,438,688	9,630,721	7,575,031	6,553,000	7,005,000
†Total	579,385,820	568,666,683	564,564,662	520,050,000	578,290,000

*Estimated
†Totals include tonnage from other states not listed above.

of the tonnage was finally closed, it was reported, at $1.50, mine-run basis.

But whatever the delays in inaugurating the lake shipping season, the trade made up for it in volume when the movement was well under way. Final records for the season show a total of 28,159,076 net tons of bituminous cargo and 1,584,778 tons of vessel fuel, or a total of 29,734,854 tons moved to the lakes, as compared with 27,862,996 tons in 1925, 24,322,552 tons in 1924 and 31,457,294 tons in 1923.

EXPORTS ACTIVE

The general walkout of the British miners on May 1 immediately started discussion of exports from this country. May shipments to foreign countries, including Canada, increased nearly 50 per cent over the April figures; June totals of 2,139,166 gross tons, were approximately 33⅓ per cent greater than the May shipments. July showed a still sharper increase when the total jumped to 3,240,194 tons. In August the increase was more moderate. The same was true of September, but in October the shipments rose to 4,188,365 tons and piers were working to capacity. In November, the latest month for which figures are available, the total was 4,605,169 tons.

The total export shipments for the first eleven months of the year, compared with figures for the corresponding period in 1925, were as follows:

Bituminous Exports from United States

To	Jan. 1 to Nov. 30 1926 Gr. Tons	1925 Gr. Tons
France	305,009	233,126
Italy	1,299,686	760,168
Other Europe	10,299,226	24,484
Canada	10,889,383	10,847,484
Panama	339,942	289,029
Mexico	108,536	98,240
Newfoundland and Labrador	69,980	97,910
British West Indies	273,245	141,067
Cuba	494,780	552,240
French West Indies	92,342	110,549
Other West Indies	162,776	123,773
Argentina	795,435	129,001
Brazil	951,651	550,210
Chile	3,040	24,357
Uruguay	118,150	13,797
Egypt	277,546	35,730
French Africa	202,587	93,986
Other countries	509,995	70,784
Total	27,193,309	14,195,935

The greater part of the 10,299,226 tons shown in the foregoing table as destined to "Other Europe" went to Great Britain and the Irish Free State. At the start buying for British interests was in the hands of a small committee and much of the tonnage was placed before American producers as a whole were aware of what was happening.

While many export factors were counting upon a rush of orders to the low-volatile fields, the committee outguessed the prospective sellers by placing a substantial amount of business with the high-volatile mines. As a result, while coal at Hampton Roads did at one time reach $12 f.o.b. piers, the average for all export coal over the eleven months was under $5 and this figure includes freight to the point of export.

New England, which belittled the export trade for months, probably was caught in the worst price jam of any market. About the time that the buyers in that section began their old game of playing off southern West Virginia against central Pennsylvania they discovered that the Pennsylvania operators were enjoying such a substantial demand in other directions that they were not inclined to dump coal into the Northeast at any price the New Englander cared to set. Although some high prices actually were paid before the boom was over, the volume of tonnage moving at top figures into New England was small.

Notwithstanding the check on the shipment of spot Kentucky and West Virginia tonnage to the Middle West during that period buyers in that section consistently refused to be stampeded. What they were unable to obtain on contracts or spot at prices which met their ideas they went without, shifting orders to fields nearer home. Northern tidewater markets also showed small inclination to compete with export buyers when foreign placements got beyond the control of the central purchasing committee.

A buying flurry did break in Ohio and production was increased at a rapid rate. Hysterical purchasing, however, was short-lived. As production continued to mount week after week and the railroads were able to take care of domestic requirements without serious delays, and with only sporadic evidences of car shortage in a few fields, panicky feelings were allayed. With the end of the British strike feverish interest abated. A heavy movement kept up, however, because old orders still were running to tide and many consumers began to accumulate storage reserves against increased winter demand and as protection against any possible suspension in the union fields on April 1, 1927.

The anthracite industry, with an estimated output of 85,000,000 net tons last year, quickly recovered the ground it had lost by the strike which began on Sept. 1, 1925, and did not end until the middle of last February. After the first hesitancy, encouraged, if not inspired, by retail distributors who found themselves loaded up with coke and bituminous coal for which they saw no market, there was a rush for anthracite from Eastern householders which kept the mines going at high seed until late in the year.

To add an element of novelty to the situation, about the time demand for the larger sizes began to taper off, the steam sizes began to command more interest. This interest was excited in part by the situation in bituminous coal. In some cases steam plants equipped to burn either fuel turned to anthracite because they could buy it at lower prices than were then ruling in the bituminous tidewater markets. Curtailed production as domestic demand became easier also played a part in the situation. Some credit, too, must be given to the determined efforts which the operators have been making to widen the market for No. 1 buckwheat.

In the bituminous industry the outlook to April 1 is very promising from a production standpoint. Until the labor situation is less confused, forward-looking consumers will continue to build up their stockpiles. After April 1, if there is no strike or if there is only a brief suspension, production is due for a drop. However, if the predictions of business prophets may be accepted at their face value, there will be a healthy demand for fuel for industry throughout the year, but the total output will be under that of 1926.

In the anthracite industry there is every reason to expect that the situation will be a normal one for the rest of the calendar year. The hard-coal producers have been promised a surcease from major labor disturbances until 1930 and they have expressed a determination to employ the intervening time in the building up of their markets.

In the bituminous industry there are many producers and sales organizations with a merchandising viewpoint which squares with the best practice in other lines of distribution. More and more hit-and-miss methods are yielding to programs based upon careful and intensive study of markets. Through various local associations producers are building up a statistical background for their merchandising operations and this work is receiving the active encouragement of the National Coal Association.

Midwest Market Gains Little Profit In Coal Trade Flurries

By H. A. Requa

Flooding of territory with Eastern coals curtailed markets of Illinois and Indiana producers, while buyers refused to be stampeded by "world shortage" reports.

THOSE ENGAGED in the coal industry in the Middle West have no cause to look back with much pleasure on 1926. From a local Indiana-Illinois view, the year was devoid of either excitement or profit—more especially profit. Competition from home and outside mines was keen enough to break the stoutest heart and stretch the strongest bank account. Few coal producing companies, during the year, were able to show a profit. Fewer still paid dividends to their long suffering stockholders.

An analysis of the situation would fill volumes, and still leave much unsaid, but the main causes of the unfortunate state of the Illinois and Indiana coal companies, are obvious: First, overproduction, and second, the high wages called for by the Jacksonville agreement. When we say "overproduction," we are not referring to overproduction from local mines, but from the mines of the country, which put so much coal on the market that the Illinois and Indiana operators had to fight harder than ever for their share of it.

Quietness Marks Year

There were a few high spots, if one may use the term, but nothing came of them in the end. Outside of the anthracite strike, which terminated in February, and the November flurry caused primarily by the British strike, with the resulting "world coal shortage," the year was devoid of any unusual events. One constructive item, which must not be overlooked, is the fact that the operators, during the year just ended, were forced to put in more efficient means of extracting coal at their mines. Overhead was whittled down to the last cent, and sales methods were overhauled, revised and brought to a high plane of efficiency. In short, the Middle West operators, who survived 1926, find themselves in fighting trim, trained down to an ounce and, from an operating and sales standpoint, ready to hold their own against almost any competition.

In January and February business was relatively good, especially on domestic sizes. This was due to the anthracite strike. Eastern soft coals, ordinarily coming into the Chicago and Midwest markets, were diverted to New England and other Eastern markets to act as substitutes for hard coal. This left the Middle West practically dependent on local mines, with a fair amount of benefit accruing to the local mines. As soon as the anthracite strike was settled, the Middle West was again invaded by cheap, non-union coal from West Virginia and eastern Kentucky, so by early March prices on nearly all Illinois, Indiana and western Kentucky coals had been cut to the bone.

Prices Low All Spring

This low price period lasted all of the spring season, and most of the summer. In July there was a slight pickup, noticeable only because conditions had been so unsatisfactory immediately beforehand. Ordinarily, when the retail trade is out of the market, the price on small steam sizes, such as screenings, advances, but in 1926 the big industries evidently had enough storage coal to keep them off the market. Consequently, prices on all steam coals for the whole year were relatively low. One railroad, for instance, was able to purchase last summer a sizable tonnage of western Kentucky shaft mine-run as low as $1.10. All during the summer, too, non-union western Kentucky coal, as well as strip mine coal from Illinois and Indiana, was a thorn in the side of the companies operating shaft mines on the union wage scale.

In the early fall business picked up some, but nothing of any note developed until late in October. Along about that time all Eastern coal suddenly disappeared from the Middle West market. Prices obtained for this Eastern coal were so high at seaboard and in the Eastern states, that the Middle West market could not, or would not, pay the price. These high prices were a direct result of the British strike.

The Middle West, however, refused to join in the wave of hysterical coal buying. The Middle West market even stood pat when it was learned that a few thousand tons of Illinois coal were being shipped to New Orleans for export. The excitement, however, was short-lived. For the moment coal operators realized, or thought they did, that the demand was going to be strong, then they opened mines that had been closed long since. The result was a flood of coal that sent the prices tumbling, and punctured all ideas of profitable coal production based on "world shortage."

Normally, in the fall and winter months, prices on the larger and more popular domestic sizes advance on the first of every month. In 1926 circular prices remained unchanged practically from October to the end of the year. During the height of the "world shortage" excitement, however, some prices were advanced, but in each case the advance did not hold for more than a few weeks—in some cases only a few days. It is even doubtful if the circulars maintained until the end of the year would have held had it not been for a series of unusually cold spells of weather.

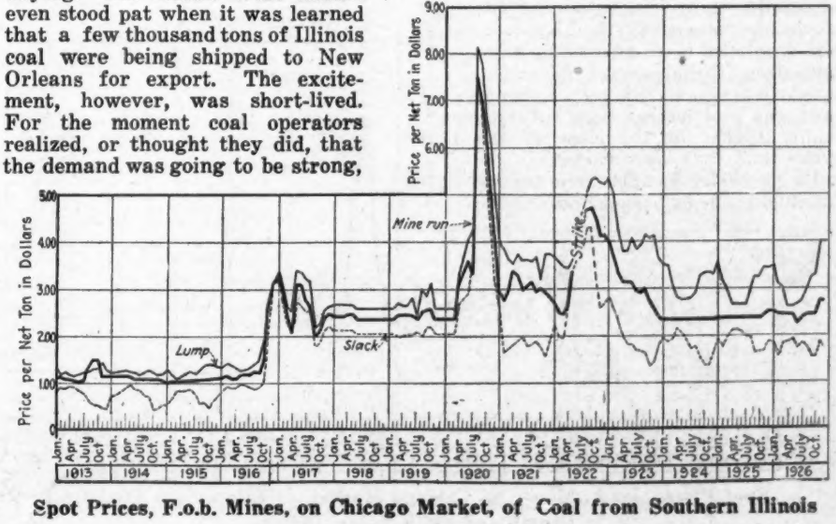
Competition Is Severe

Even at that, Illinois and Indiana operators did remarkably well, when one stops to realize the competition they had to meet toward the end of the year. For instance, in the middle of December any number of West Virginia high-volatile producers were offering their product freely in the Middle West at summer prices. Large quantities of good 4-in. West Virginia block were offered in December in the Chicago market at around $2.25 per ton, f.o.b. mines, and during the spring and summer months prices were approximately at the same level. Practically all the Illinois and Indiana producers held their prices, even if it was

Spot Prices, F.o.b. Mines, Southern Illinois (Franklin County) Coal, 1926

CHICAGO MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$3.50	$2.50	$1.83	$2.86
February	3.12	2.47	1.58	2.62
March	3.00	2.43	1.84	2.60
April	2.60	2.43	1.89	2.42
May	2.60	2.43	1.93	2.43
June	2.66	2.25	1.74	2.35
July	2.75	2.38	1.83	2.46
August	3.00	2.43	1.73	2.58
September	3.22	2.43	1.53	2.65
October	3.30	2.43	1.57	2.70
November	4.00	2.77	1.88	3.20
December	4.00	2.75	1.75	3.18
Yearly average	3.15	2.47	1.76	2.67



Spot Prices, F.o.b. Mines, on Chicago Market, of Coal from Southern Illinois

Spot Prices, F.o.b. Mines, of Central Illinois Coal, 1926

CHICAGO MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$3.13	$2.30	$1.39	$2.53
February	2.70	2.12	1.12	2.22
March	2.56	2.12	1.43	2.21
April	2.33	2.06	1.62	2.07
May	2.33	2.08	1.68	2.13
June	2.34	2.08	1.63	2.12
July	2.43	2.12	1.50	2.16
August	2.63	2.16	1.50	2.26
September	2.66	2.20	1.43	2.28
October	2.83	2.20	1.43	2.36
November	3.50	2.57	1.64	2.83
December	3.08	2.26	1.45	2.49
Yearly average	2.71	2.19	1.49	2.30

necessary for them, from time to time, to curtail the production of their mines in order to do so.

1927 Considered Critical

The Middle West is, of course, vitally interested in the immediate future, for 1927 will prove a tremendously important, not to say critical, year for its mines, as the Jacksonville agreement with the United Mine Workers terminates on March 31. Those in position to know most about this interesting feature frankly admit that any prophesy for the immediate future is at best a guess. Most of them, of course, are optimistic, as they realize there must be some change and any change must be for the better, if for no other reason than because conditions could not possibly be worse than they have been. But then, the Illinois and Indiana operators are a hardy breed, else but few of them would have survived thus far.

Northwestern Docks Enjoy Rising Demand in 1926

Coal dock operators at Duluth and Superior experienced satisfactory trade during 1926 from almost every point of view. Beginning with the early fall period all classes of consumers contracted for their season's supplies on such a liberal scale that stocks of free bituminous coals on the docks were reduced to a minimum. So much so that operators found themselves sold up in some lines especially in Pocahontas and other smokeless coals that were in demand as anthracite substitutes.

Another gratifying condition for docks operators and their customers developed in an advancing price situation throughout the season, quotations in all classes of steam and gas coal having been substantially higher at the close of the year than they were earlier.

A good trade in anthracite turned up during the last two months of the year and as a result of short supplies of Pocahontas and other substitutes, operators are sanguine that only moderate tonnages of that coal will be carried over.

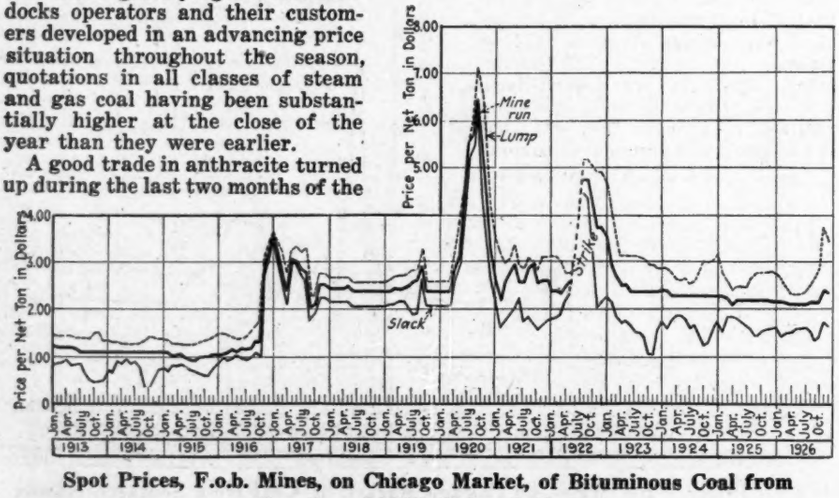
Monthly receipts of coal at Duluth and Superior docks during the 1926 season of navigation are shown in the following table of bituminous and anthracite, in net tons:

Month	Hard	Soft	Total
May	115,538	1,691,569	1,807,107
June	245,707	1,800,998	2,046,705
July	269,220	1,636,714	1,905,934
August	269,664	1,279,290	1,548,954
September	95,574	844,893	940,467
October	105,759	901,003	1,006,762
November	124,812	764,057	888,869
December	46,699	250,132	296,831
Total for season	1,272,973	9,168,656	10,441,629

Spot Prices, F.o.b. Mines, of Indiana, 4th and 5th Vein Coals, 1926

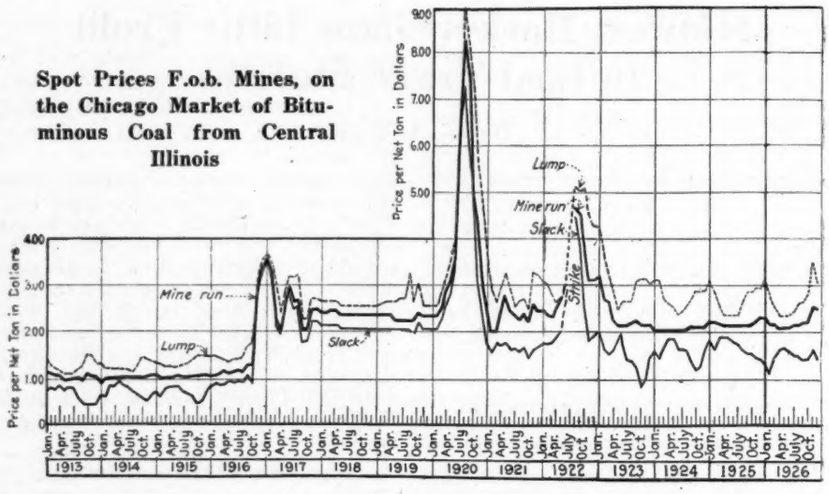
CHICAGO MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.75	$2.14	$1.62	$2.29
February	2.62	2.14	1.43	2.19
March	2.48	2.10	1.50	2.13
April	2.30	2.08	1.52	2.06
May	2.30	2.08	1.60	2.07
June	2.30	2.08	1.61	2.07
July	2.38	2.08	1.62	2.10
August	2.50	2.13	1.55	2.16
September	2.63	2.13	1.35	2.17
October	2.82	2.13	1.42	2.27
November	3.75	2.41	1.73	2.81
December	3.44	2.36	1.67	2.66
Yearly average	2.67	2.15	1.55	2.25



Spot Prices, F.o.b. Mines, on Chicago Market, of Bituminous Coal from Fourth and Fifth Veins, Indiana

Spot Prices F.o.b. Mines, on the Chicago Market of Bituminous Coal from Central Illinois



The comparative statement of shipments for the last eight years follows:

Year	Hard	Soft	Total
1919	1,795,257	7,079,840	8,875,097
1920	1,637,477	7,393,219	9,030,696
1921	1,844,642	8,320,207	10,164,849
1922	566,362	5,138,934	5,705,296
1923	1,419,984	11,268,337	12,688,321
1924	1,289,994	7,730,878	9,020,872
1925	790,132	8,882,569	9,672,701
1926	1,272,973	9,168,655	10,441,629
Average total received during the last eight years			9,449,933

Comparative shipments on cars from Duluth and Superior coal docks during the calendar years 1926, 1925 and 1924 as compiled by the Western Weighing and Inspection Bureau were as follows:

	1926 Cars	1925 Cars	1924 Cars
January	23,990	27,693	25,984
February	19,219	17,666	17,188
March	14,836	16,388	13,619
April	11,855	9,210	15,683
May	11,808	12,302	13,728
June	12,659	11,955	13,401
July	16,223	14,693	15,301
August	18,306	20,778	18,589
September	27,590	24,032	24,373
October	30,993	31,685	26,418
November	35,531	27,411	28,705
December	32,687	25,735	29,615
Totals	255,697	239,548	242,604

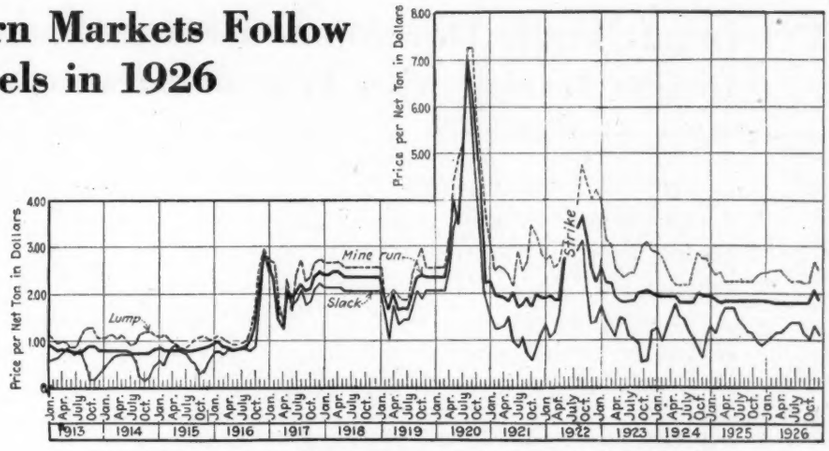
For several years the freight rate adjustment from the docks was a sore point with the shippers at the Head of the Lakes. But last year the docks were able to put tonnage into the southern fringe of the Northwestern states with a greater degree of success than for some time past.

With the exception of 1923, when 12,688,321 tons of coal were unloaded at the Duluth-Superior docks, receipts last year were the largest in any navigation season since the war. Anthracite receipts, however, while greater than in the strike years of 1922 and 1925, were the lowest in several years.

Bigger Trestle for Sodus Bay.—The Pennsylvania Railroad Co. appears still to believe in the future of the Lake Ontario coal trade, for it is preparing to rebuild its trestle at Sodus Bay on a much larger scale than the present one, which had become rather ricketty. Pier and other harbor improvements also are planned that speak for a big tonnage next season. The work has already begun with a force of 85 men, to operate cranes and dump cars. The old pier is already partly torn down.

Southwest and Western Markets Follow Routine Channels in 1926

Domestic prices work to lower levels, but some steam grades gain. Sharp slash in Utah lump to save steam trade from shortage of slack the most exciting development of year.



Spot Prices, F.o.b. Mines, on St. Louis Market, of Coal from Standard Field of Illinois

SOUTHWESTERN PRICES were rather unsatisfactory in 1926, but otherwise last year was a big one for all branches of the coal trade. Production probably increased nearly 10 per cent over 1925, or about in line with the larger output in other sections, but f.o.b. mine prices held close to a cost basis.

The $5 price for Kansas deep-shaft lump of last January was never equalled in later months, with the price dropping to $4 in May. A gradual rise starting in August left prices at the close of the year at $4.50@$4.75 for Kansas lump, or 25 to 50c. lower than a year ago. Screenings at $2.35, however, were unchanged.

Missouri lump prices show the same decline as Kansas grades, but Missouri screenings were somewhat higher than a year ago. Oklahoma prices were 25 to 50c. lower than a year ago for both domestic and steam grades. Some Arkansas semi-anthracite sold at $1 below the 1925 basis, but Paris, Spadra, and the other favored districts held their ground.

A feature of the year, from an operator's standpoint, was the successful fight in Oklahoma against the labor unions. Oklahoma is now about 90 per cent open-shop, and the semi-anthracite field in Arkansas is also largely open-shop, although Spadra and Paris continue on a strictly union basis. Another unusual feature was the strikeless year in the Kansas field.

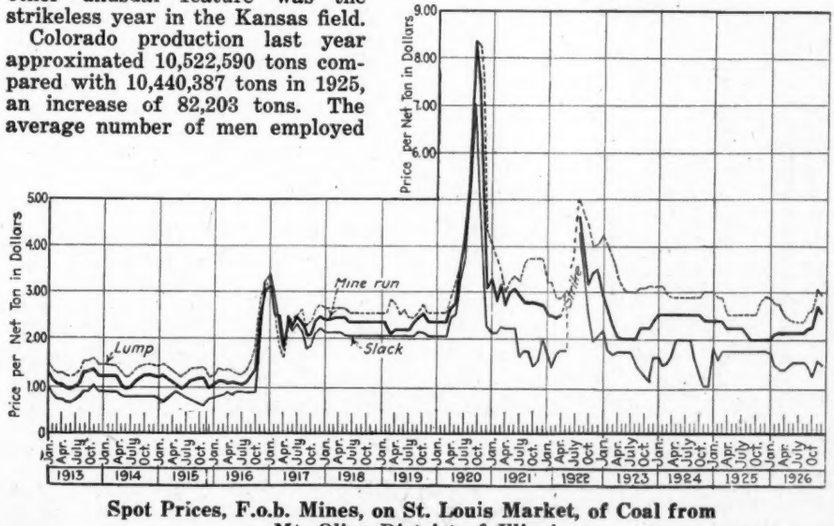
Colorado production last year approximated 10,522,590 tons compared with 10,440,387 tons in 1925, an increase of 82,203 tons. The average number of men employed was 11,414 compared with 11,829 the preceding year. The number of days worked per mine for the year 1926 averaged 162.6 contrasted with 157.9 for 1925.

The minimum f.o.b. mine price on lump coal was $4.50; nut, $3.75, and the maximum price for the year 1926 was $6 on lump and $5 on nut. The minimum price on Rock Springs-Kemmerer domestic lump coal for 1926 was $3.75 and domestic nut $3.50, while the maximum prices were $4.50 and $4.

The industry was fortunate in not suffering any handicaps due to labor shortage or transportation facilities and was also fortunate in not recognizing the union.

It is rather difficult to forecast just what the outlook for 1927 business will be as it is entirely predicated on weather and strike conditions. The year 1926 has not been what would be termed a profitable year for the coal industry.

The high spot of 1926 in the Salt Lake City market territory was the sensational price reduction which was announced in the early part of May. Large sizes dropped overnight from $4.50 at the mines to $2.50, and this price held good for practically all prepared sizes till the early fall. This price, the lowest in years was due, some said, to a price war.



Spot Prices, F.o.b. Mines, on St. Louis Market, of Coal from Mt. Olive District of Illinois

Spot Prices, F.o.b. Mines, Coal of Standard District (Ill.), 1926

ST. LOUIS MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.44	$1.83	$0.95	$1.96
February	2.49	1.81	1.06	2.00
March	2.50	1.80	1.18	2.02
April	2.50	1.80	1.18	2.02
May	2.35	1.80	1.27	1.95
June	2.25	1.80	1.37	1.94
July	2.25	1.80	1.38	1.94
August	2.25	1.80	1.38	1.94
September	2.20	1.80	1.17	1.88
October	2.22	1.80	1.01	1.86
November	2.67	2.03	1.30	2.23
December	2.50	1.87	1.11	2.04
Yearly average	2.39	1.83	1.20	1.98

An acute shortage of slack doubtless had much to do with the price situation. A few of the largest industries consuming slack had to resort to the pulverizing of prepared sizes of coal in order to keep going. The low prices were passed on to the consumer, with the result that considerable coal was stored for winter use, and the mines, by reason of the additional working time, were able to supply the market for slack all summer. Not a little coal for domestic use was sold on a c.o.d. basis. A reduction of 50c. was offered by the dealer for cash, an innovation in the local retail market, but discontinued when the prices went back to normal.

The year was uneventful in the matter of labor conditions, car supply, accidents, or fires at the mines, and production.

Output was 4,248,000 tons up to the week ending Dec. 18, compared with 4,690,000 tons for the whole of 1925.

Spot Prices, F.o.b. Mines, Coals of Mt. Olive District (Ill.), 1926

ST. LOUIS MARKET

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.88	$2.00	$1.75	$2.38
February	2.78	2.12	1.49	2.33
March	2.75	2.15	1.40	2.30
April	2.50	2.15	1.40	2.18
May	2.43	2.15	1.49	2.16
June	2.38	2.15	1.55	2.15
July	2.38	2.15	1.55	2.15
August	2.38	2.15	1.55	2.15
September	2.57	2.23	1.47	2.26
October	2.63	2.25	1.25	2.26
November	3.07	2.72	1.60	2.68
December	2.94	2.56	1.53	2.56
Yearly average	2.64	2.23	1.50	2.30

Cincinnati Trade Developments in 1926 Furnish Market with Year of Surprises

Aftermath of anthracite strike sustains low-volatile prices for several weeks. Midsummer dullness is changed to feverish activity by British strike and panic American Buying.

By Harold W. Coates

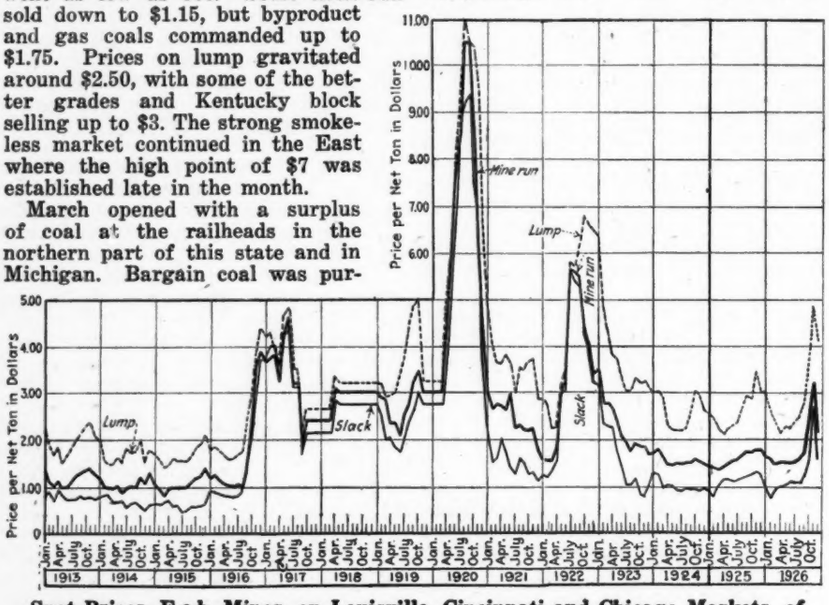
THE PAST YEAR in the Cincinnati market was a year of surprises. First came the backwash from the close of the anthracite strike, with the market holding firm for weeks longer than had been expected. Next came the quick slough of the downward curve followed by six to eight weeks' delay in the opening of the lakes which made the sellers of coal of the opinion that a low price was the proper course—judgment that left its own pangs of regret. A dead June and a worse July with retailers and others begged to stock up—and then the deluge with eyes turned to the seaboard for the fall harvesting ground instead of to inland markets.

The move to increase the wages in the non-union fields selling through the Cincinnati markets brought its criticism; the petering out of the British strike brought recessions, the threat of wage reductions left the tail-end of the year with an air of uncertainty and to add to the galaxy of such a review the prices tumbled so that all concerned had to keep a weather eye out. Hardly a month in the whole of the twelve ran true to form.

The year opened with zero weather to help along the aftermath of the protracted hard coal strike and even though peace had been but recently concluded that were no great price changes that followed. Early in January smokeless sold for Eastern delivery at \$2.75@\$3.25 for lump, \$2.50 for mine-run and \$1.75 for slack. Bituminous offerings from West Virginia and southeastern Kentucky were not so happily placed and their range was \$2.50 for lump and block, \$1.50@\$1.75 for mine-run and \$1@\$1.25 for slack. Traffic jams at Toledo and Detroit late in the month hurt high-volatile quotations, but smokeless lump moved up to \$5.50@\$6.

The old specter of overproduction made its bow early in February when high-volatile shippers began to search for places to put their coal. There were times during this month that slack went as low as 50c. Some mine-run sold down to \$1.15, but byproduct and gas coals commanded up to \$1.75. Prices on lump gravitated around \$2.50, with some of the better grades and Kentucky block selling up to \$3. The strong smokeless market continued in the East where the high point of \$7 was established late in the month.

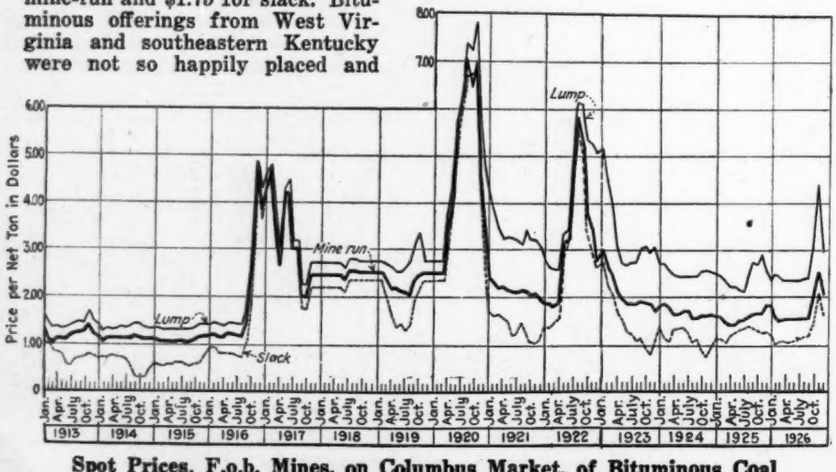
March opened with a surplus of coal at the railheads in the northern part of this state and in Michigan. Bargain coal was purchased and loaded into the lake freighters. This relieved the situation somewhat and brought the local market back to 90c.@\$1 on slack and put mine-run up to \$1.25. The bull market in smokeless, however, began to taper off with lump at \$4@\$4.25, mine-run \$2.25 and slack \$1.25@\$1.50. This drop synchronized with lake-contract negotiations and it was freely said that a large amount of that business was closed at \$1.65 for mine-run and some as low as \$1.50.



Spot Prices, F.o.b. Mines, on Louisville, Cincinnati and Chicago Markets, of Bituminous Coal from Eastern Kentucky

A quickening industrial demand for splints and steam sizes brought the bituminous market into better humor in April even though the prices continued to sag with the lump and block quoted around \$1.75@\$2; mine-run, \$1.25@\$1.75 and slack 75c.@\$1. Smokeless receded to \$2.75@\$3 for lump, \$2 for mine-run and \$1.25@\$1.50 for slack. May saw much of the pressure relieved with the opening of the lakes—though it took nearly two weeks to reflect a betterment in prices. The British strike reacted on smokeless prices; with lump leading in the advances.

The influence of the suspension overseas became stronger in June. Lake buyers found it hard to get contract coal at a \$1.75 mine-run basis. Raising



Spot Prices, F.o.b. Mines, on Columbus Market, of Bituminous Coal From Hocking, Ohio, District

Spot Prices, F.o.b. Mines, Southeastern Kentucky Coal, 1926

AVERAGE OF QUOTATIONS ON CINCINNATI, CHICAGO AND LOUISVILLE MARKETS

Month	Lump	Run of Mine	Slack	Weighted Av All Sizes
January	\$3.02	\$1.67	\$1.03	\$2.38
February	2.65	1.61	.79	2.10
March	2.38	1.50	.98	1.94
April	2.14	1.56	1.01	1.82
May	2.26	1.56	1.05	1.90
June	2.22	1.54	1.13	1.88
July	2.35	1.57	1.10	1.94
August	2.48	1.65	1.10	2.06
September	2.79	1.74	1.23	2.29
October	3.71	2.28	1.55	3.02
November	4.89	3.12	2.72	4.13
December	4.13	2.14	1.63	2.65
Yearly average	2.92	1.83	1.28	2.34

Spot Prices, F.o.b. Mines, Hocking District (Ohio) Coal, 1926

COLUMBUS MARKET

Month	Lump	Run of Mine	Slack	Weighted Av. All Sizes
January	\$2.39	\$1.83	\$1.20	\$1.97
February	2.50	1.60	1.01	1.90
March	2.47	1.53	1.08	1.87
April	2.38	1.55	1.10	1.85
May	2.38	1.56	1.08	1.85
June	2.38	1.55	1.10	1.85
July	2.38	1.56	1.12	1.85
August	2.40	1.58	1.18	1.88
September	2.43	1.58	1.20	1.89
October	3.08	2.02	1.45	2.39
November	4.41	2.59	2.04	3.31
December	2.97	2.04	1.66	2.39
Yearly average	2.68	1.75	1.27	2.08

embargoes against the lakes also helped to make the flow of fuel traffic easier. In July the export business began to compete with that of the lakes. When the September rush commenced demand was coming from all sides—from the retailer, lakes and from seaboard. Late August saw smokeless prices $1 over June quotations. Lump went to $4; mine-run, $2, and slack, $1.25@$1.50.

The first show of congestion at the tidewater piers came in September and regulatory measures were put in effect by the C. & O. and the N. & W. railways. Instead of acting as a brake this stimulated prices, with smokeless lump going to $4.50; mine-run, $2.50@$2.75, and slack, $1.75@$2. High-volatile West Virginia lump moved up to $2.50 @$3, mine-run, $1.65@$1.85 and slack, $1.25@$1.35. By the end of the month lump was bringing $3.50, mine-run, $2 and slack, $1.25@$1.50.

October brought a runaway market which carried spot prices on smokeless lump to $5@$5.50 as against the circular price of $4.50@$5, mine-run, to $2.75@$3 and slack, $2@$2.50. Then came car shortages in the southeastern Kentucky fields which cost the shippers at least a cut of 13,000 cars in production and a potential loss of $1,000,000 in the weeks that followed. The last week in October saw a mad scramble, with almost any spot tonnage snapped up at $6.

November had not gone far when word came of the end of the British strike, causing a slow-up. The Bureau of Mines estimate of the large stocks in storage also hurt. Wild rumors of congestion and coal in distress also had their effect. The sagging almost became a collapse with the buyers exerting every influence to make it so. The bituminous market eased off first to $3@$3.75 for lump; $2@$2.50 for mine-run. The smokeless interests temporized with the situation to a somewhat better degree and wound up the month with prices ranging from $4@$5.25 for lump and $3.50 for mine-run.

The rest of the year was given over to fencing to find the basis on which 1927 could be started with some degree of security. From the high points of November the smokeless dropped to $3@$4 for lump, $2.50@$3 for mine-run and $2@$2.50 for slack. West Virginia bituminous lump eased off to $2.50@$3; mine-run, $1.50@$2.25 and slack $1.25@$2; Kentucky block dropped to $2.75@$3.25; mine-run, $1.50@$2.25, and slack, $1.25@$2.

Spot Prices, F.o.b. Mines, Southern West Virginia Smokeless Run-of-Mine Coal, 1926

VARIOUS MARKETS

Month	Columbus	Chicago	Cincinnati	Boston	Average All Markets
Jan....	$2.82	$2.18	$2.43	$2.07	$2.37
Feb....	2.52	2.19	2.35	2.12	2.29
March	2.10	1.93	2.19	1.68	1.98
April...	1.93	1.83	1.92	1.51	1.80
May...	2.03	1.97	1.82	1.84	1.92
June...	2.09	1.93	2.00	1.69	1.93
July...	2.13	1.93	2.00	1.76	1.95
Aug...	2.17	2.22	2.25	2.44	2.27
Sept...	2.44	2.60	2.75	2.70	2.62
Oct....	3.21	3.23	3.11	4.11	3.42
Nov...	3.87	3.75	3.72	5.29	4.18
Dec....	3.06	2.89	2.97	3.01	2.99
Yearly average	2.53	2.39	2.46	2.52	2.46

Pittsburgh District Still in Grip Of Competitive Adjustment

Spectacular developments of 1926 leave coal and coke producers in a maze of uncertainties as to the future. Financial returns disappointing.

By B. E. V. Luty

WESTERN Pennsylvania coal men and Connellsville coke operators found 1926 a very unsatisfactory year. There were spectacular events which brought the trade nowhere, bizarre movements which furnished no augury for the future. The outlook was just as uncertain at the end of the year as at the beginning. The only definite marked change was that the situation was more complicated.

In the price of Pittsburgh district steam coal the high of the year was two and one-half times the low, but the total tonnage of the year was small and the profits were inconsequential. The high and low were approximately $4.50 and $1.75. Gas lump ranged from $2.20 to $5. In neither grade was much coal sold at the extreme prices.

Connellsville furnace coke ranged from $2.75—at which a considerable tonnage was sold—to $5—at which a few thousand tons were sold—and $5.50 —at which a few carloads were sold.

Several years ago the production of solid fuel in western Pennsylvania was confined very largely to Pittsburgh district coal, and Connellsville coke. The two were entirely distinct. Pittsburgh district coal was not coked, and Connellsville coal was used only for coking at the mines. Today Pittsburgh district coal is shipped for byproduct coking. Operations to market raw coal for steam, gas and byproduct purposes have spread greatly—to a moderate extent to the north, in the Bessemer district; to a great extent to the east and southeast, in Westmoreland County; and to a great extent to the south and southwest, to the state line.

The first spectacular development in that direction was the opening, about 1900, of the Klondike, Masontown or Lower Connellsville region, as a beehive coking coal district supplementing what had been called "the Connellsville region," since designated when a distinction is necessary as "the old basin." Development proceeded through Greene County, in the southwestern corner of the state, making western Pennsylvania coal mining continuous with that of West Virginia.

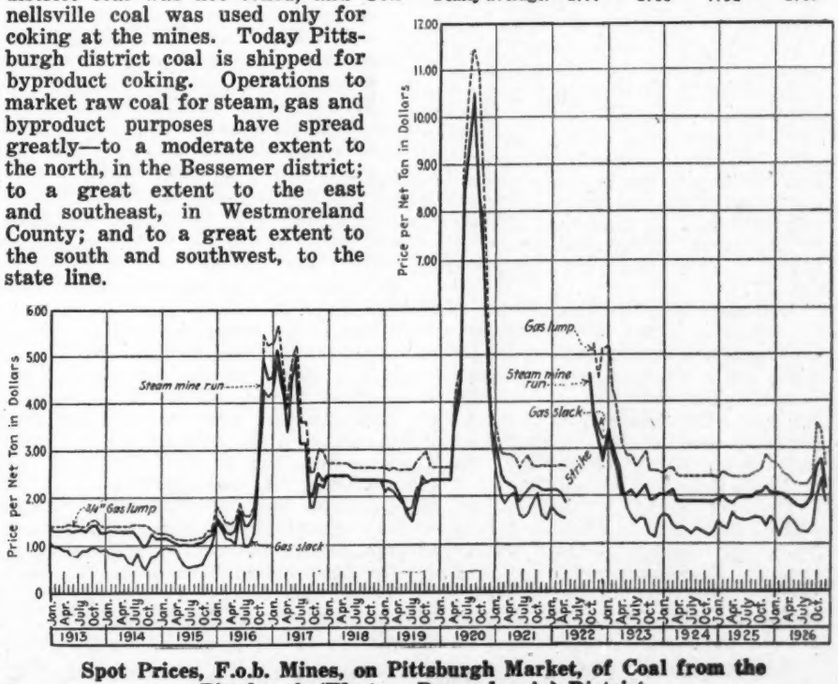
For many years the Connellsville region proudly held the position that it made the best metallurgical coke in the world and ignored any notion that its coal should be shipped. It was too good for coking to be shipped as ordinary coal or even as extraordinary coal. In time byproduct coking came to employ coal from many fields, but it was only very grudgingly that the owners of Connellsville coal acreage yielded to the idea that such coke could be good coke and afterwards that they would have to ship raw coal in order to liquidate their holdings.

By reason of these various changes, in a trifle more than a quarter century

Spot Prices, F.o.b. Mines, of Pittsburgh District (Pennsylvania) Coal, 1926

PITTSBURGH MARKET

Month	Lump	Run of Mine	Slack	Weighted Av. All Sizes
January.....	$2.68	$2.05	$1.46	$2.09
February.....	2.62	2.05	1.17	2.01
March.....	2.45	2.01	1.41	2.00
April.....	2.40	1.95	1.55	1.97
May.....	2.29	1.83	1.47	1.87
June.....	2.25	1.77	1.28	1.79
July.....	2.25	1.75	1.25	1.77
August.....	2.26	1.81	1.24	1.80
September.....	2.40	2.00	1.34	1.96
October.....	3.55	2.61	1.98	2.72
November.....	3.44	2.78	2.31	2.84
December.....	2.66	2.15	1.84	2.21
Yearly average.	2.77	2.06	1.52	2.09



Spot Prices, F.o.b. Mines, on Pittsburgh Market, of Coal from the Pittsburgh (Western Pennsylvania) District

Spot Prices, F.o.b. Mines, Pittsburgh No. 8 (Ohio) Coal, 1926

CLEVELAND MARKET

Month	Lump	Run of Mine	Slack	Weighted Av. All Sizes
January	$2.31	$1.83	$1.38	$1.94
February	2.33	1.88	1.08	1.92
March	2.29	1.88	1.34	1.94
April	2.24	1.84	1.49	1.93
May	2.16	1.76	1.31	1.83
June	2.16	1.76	1.24	1.82
July	2.15	1.72	1.20	1.79
August	2.18	1.76	1.32	1.84
September	2.17	1.74	1.24	1.82
October	3.02	2.30	1.82	2.48
November	3.41	2.66	2.11	2.84
December	2.66	1.99	1.61	2.17
Yearly average	2.42	1.93	1.43	2.03

past, the Connellsville region has entirely lost its plain distinction from other parts of the bituminous industry. In matters of labor and marketing conditions it is associated with its neighbors, and there is no precise line where the region ends and the neighbors begin. This is illustrated by the trade sometimes using such an expression as "the fringe of the Connellsville region." A review of the year, therefore, simply considers alike all parts of the coal district of western Pennsylvania.

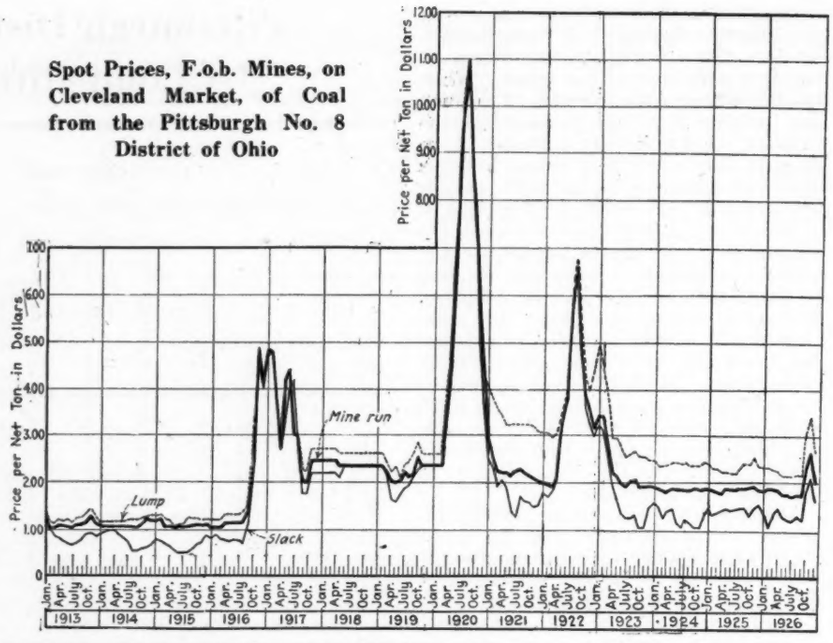
The year opened with a low degree of activity in the Pittsburgh district, fairly high activity at non-union mines in western Pennsylvania and West Virginia, and a very high degree of activity in the Connellsville region as to coke-making, because of the anthracite suspension. Large tonnages of coke were moving East for domestic fuel. During the hard-coal strike there were two peaks in Connellsville coke prices, one at $9 late in October, 1925, and another just before the settlement on Feb. 12, 1926, of $12.50. Both prices were for run-of-oven. Little coke, however, was sold at very high prices. When anthracite operations were resumed coke reverted to old prices.

During the first month or two of the British coal strike, the Pittsburgh district felt no reaction. Its union mines were largely idle, while the Pittsburgh Coal Co. was operating 12 mines open-shop at 25 to 30 per cent under the Jacksonville scale. Market prices were fixed by open-shop rather than union costs. Export demand for gas coal then developed, steam coal exports being from other sections. Prices were very moderate for some time. But early in October a sudden and sharp bulge began. This price rise culminated Oct. 27.

The same day the Pittsburgh Coal Co. put into effect a wage scale approximately 5 per cent above the union scale, and a few days later independent Connellsville operators announced an advance, effective Nov. 1, of about 40 per cent, putting wages on the same basis as the Frick scale, paid by the H. C. Frick Coke Co. since 1922.

The coal market was easier Oct. 28 and by Nov. 1 it was visibly softening. Then it tumbled as fast as it had bulged. Non-union mines elsewhere in western Pennsylvania, and in West Virginia, had advanced wages at various times. Some reduced late in the year, but larger operators, generally speaking, held off. Last week the Pittsburgh Coal Co. cut to a $6 basis.

Spot Prices, F.o.b. Mines, on Cleveland Market, of Coal from the Pittsburgh No. 8 District of Ohio



New England Trade Swings Dominated By Overseas Export Demand

Market veers from famine to feast and back again in 1926, with buyers continually fighting price trends. Anthracite makes quick recovery of domestic business.

By G. G. Wolkins

THE INFLUENCE of the British strike showed New England that bituminous supply and price can be extremely flexible. A listless demand with prices verging on actual cost was changed into a buoyant runaway market; buyers overseas entered into keen competition for every ton available, and for a period the volume moved by water was limited only by dumping capacity of all the terminals from Savannah to New York.

Smokeless operators who in February were troubled by their inability to hold a share of the all-rail domestic market gained during the anthracite strike in July were puzzling out ways to diminish the normal flow of coastwise mine-run to New England. By December it was clear the scarcity coastwise had vanished with the hungry export buyer; New England storage depots assumed to be dragging on the bottom had been partially replenished with central Pennsylvania coal, and prices on Pocahontas and New River settled down into the level of February and March.

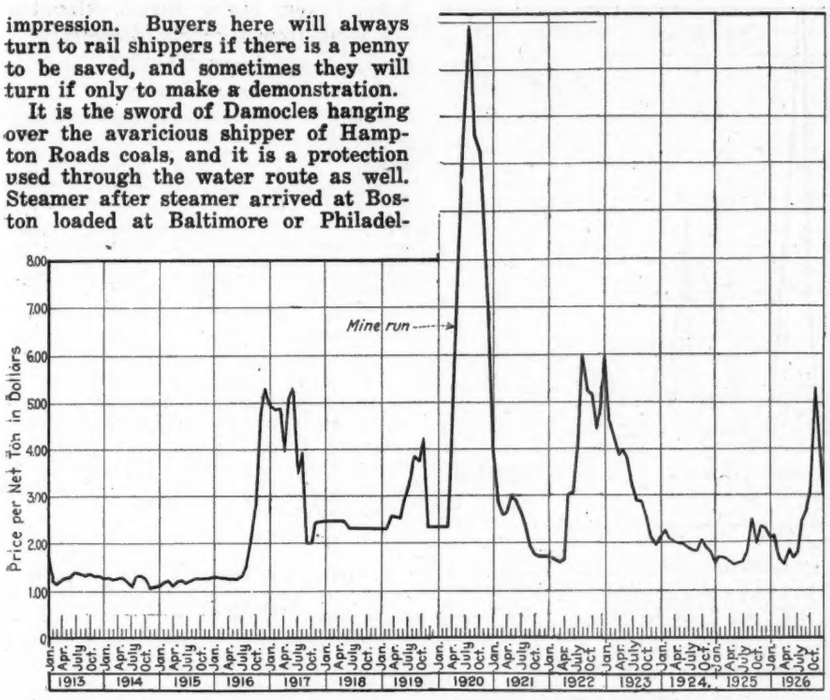
The old rule about fuels for household heating seems still to hold good in New England. The aggregate tonnage of anthracite displaced by all the substitutes—coke, gas, bituminous, oil, foreign coal, briquets, etc.—remains about equal to what might otherwise be considered the enlarged use of anthracite due to the increase in population. Both light and heavy oils are competitive along with other fuels, but taking New England as a whole the cost, the uncertainty of supply, and unperfected burners are all items difficult for oil to overcome. There are obstacles, too, for the makers of briquets on any commercial scale, but perhaps the really serious competitor of the future is the producer of gas in large volume with low rates for heating and a largely increased tonnage of coke for retail distribution.

Since 1920 changes have multiplied among New England industries. The paper trade and those allied with building and construction generally have fared reasonably well, but in shoes and machinery there have been problems to face. The textile business, in many instances, is in a state little short of precarious. Large units have been merged; some have been liquidated; a few are bankrupt; others it is possible will be moved South where labor restrictions are less burdensome. Railroads, power plants, and other utilities must share a somewhat diminished business, a change that has its bearing on the market for bituminous. One of the railroads has made an additional purchase over a five-year term, profiting doubtless by the eagerness of Southern operators to assure themselves a steady outlet.

From August through November, the Hudson River gateways were reporting heavy receipts from central Pennsylvania, Maryland, and the northern districts of West Virginia. Movement in volume was shortlived, but it made its

impression. Buyers here will always turn to rail shippers if there is a penny to be saved, and sometimes they will turn if only to make a demonstration.

It is the sword of Damocles hanging over the avaricious shipper of Hampton Roads coals, and it is a protection used through the water route as well. Steamer after steamer arrived at Boston loaded at Baltimore or Philadelphia with standard grades originating far from the smokeless region in West Virginia, and during October there was the strange spectacle in Boston of Cambria coals offered for inland delivery by factors who would ordinarily consider selling nothing but Pocahontas and New River.



Spot Prices, F.o.b. Mines, on Boston Market, of Mine-Run Coal from Smokeless Fields of West Virginia

It was apparent early in the year that $2 per net ton at the mine or $4.75 gross ton f.o.b. vessel at the Virginia terminals, was the minimum smokeless price in view for 1926. The lessons of wasteful dumping were only learned in part, and there were intervals when prices dropped to ruinous levels. The first six months, while domestic trade was "on its own," output was under better control than usual; the Western and line trade was perhaps in more favorable position to take up the slack, but even in April when values were at low ebb there was not the stuffing of re-handling plants that had been characteristic of other seasons.

A full week of anthracite mining in February showed how dependent the bituminous market can be on day-to-day conditions. Screened sizes of smokeless dropped from $8.50, until lump and egg settled into a rut of $3, while shippers struggled to rid themselves of large lots en route. Slack became a choice morsel for bargain hunters, and hundreds of cars, sized and unsized, were rejected. At Hampton Roads the sluggish tone was accentuated by quotations down to $4.25 f.o.b. vessel.

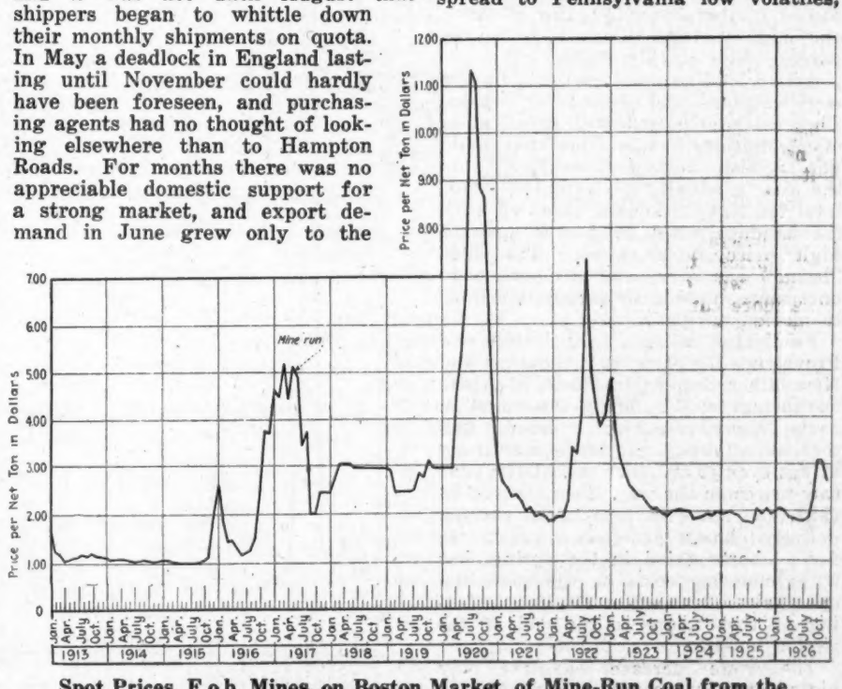
Marine freights softened, and retail contracts were taken at $5.85 net ton delivered by truck, with B.t.u. and low ash guarantees. Spot buying was scattered for several weeks, and there was active canvassing to lure buyers from accustomed channels of supply. New England showed only feeble disposition to buy; there were comfortable reserves; Pocahontas and New River dropped close to $4, and Pennsylvania coals were scarcely heard from. Immediately prior to the British strike May 1 the coastwise market was running entirely true to the form inherited from the years 1921-25.

Shortages in British coaling depots over the world and later in the United Kingdom itself made the difference. On the first inquiries the spot market rose to $4.25 and then to $4.75, as a minimum. For careful supervision of output there was now every inducement. Consumers here did not react; most of the tonnage was on contract; and it was not until August that shippers began to whittle down their monthly shipments on quota. In May a deadlock in England lasting until November could hardly have been foreseen, and purchasing agents had no thought of looking elsewhere than to Hampton Roads. For months there was no appreciable domestic support for a strong market, and export demand in June grew only to the point where it relieved accumulation. There were interludes when prices sagged to $4.25, but until late August there were only the advances that could be regarded as healthy in view of an expanding overseas market.

The New England public is convinced that bituminous is not to be relied upon as a permanent substitute for anthracite. "Six-dollar fuel" was only a phantom, and not even a drastic reduction in freight rates could make probable the use of screened Pocahontas and New River on any comprehensive scale. The average consumer gets bewildered, not only by fluctuations in price but by variation in grade and the proportion of slack. So long as this market is open to mine-run by water as well as to Pennsylvania coals by rail the smokeless shippers can hardly count upon lump, egg, stove, and nut being absorbed regularly in New England in volume any more than New England householders can prudently pin their faith to the smokeless shippers.

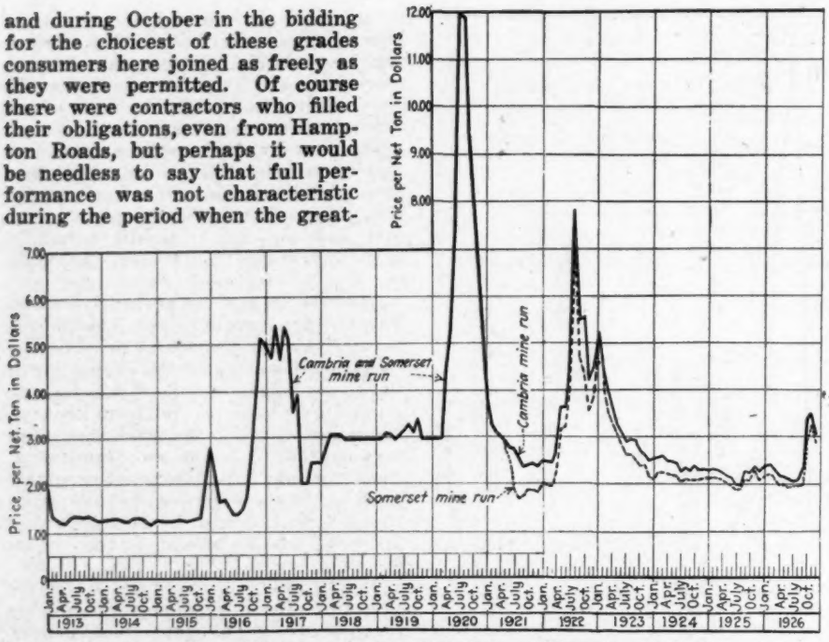
New England consumers were not prepared for the sharp upswing in August, although signs had pointed that way. High volatiles came into demand early in July, and the first 14 days of that month the Virginia piers dumped 1,100,000 tons—largely for the British government—although at the same time there was the keenest competition here to place cargoes arriving on the market. At no time did this section account for its proper share of spot business, but there was growing insistence on full quotas of contract coal, a state of affairs that obliged some shippers to make awkward decisions. Even then there was only the mildest concern among domestic buyers, they being misled by temporary checks in the general advance that was caused by the discriminating character of export buying.

By late August the smokeless agencies were in position to keep prices moving steadily upward. The demand spread to Pennsylvania low volatiles,



Spot Prices, F.o.b. Mines, on Boston Market, of Mine-Run Coal from the Clearfield District of Pennsylvania

and during October in the bidding for the choicest of these grades consumers here joined as freely as they were permitted. Of course there were contractors who filled their obligations, even from Hampton Roads, but perhaps it would be needless to say that full performance was not characteristic during the period when the greatest buoyancy prevailed in the trade.



Spot Prices, F.o.b. Mines, on Boston Market, of Bituminous Coal from Cambria and Somerset Counties, Pennsylvania

Industrial buyers came into the market only when compelled by immediate necessities, and it should be said that the aggregate was not large. The Hampton Roads situation grew tighter with accumulated bottoms; there were difficulties in all the non-union districts, in Pennsylvania as well as in West Virginia, over wage scale, and prices went up by leaps and bounds. Late in October upward of 100 ships were en route to Hampton Roads and thousands of loaded cars were strung out on the railroads, forcing a permit system. Fair grade Pennsylvania coals sold up to $4.50 per net ton at the mines, while Pocahontas and New River soared early in November to $10.50 for cargo and $12 for bunkers, the highest level touched since the panicky days of July, 1920.

Active bidding continued, but buyers were cautious and waited for breaks. They came, at length, with fitful cables of negotiations in November that would put British mine-workers back into the pits; gradually the Hampton Roads level for Navy Standard eased off until the holidays when $5.25 was again a high price f.o.b. vessel. The 1926 "boom" was over, and shippers were once more turning to eastern territory to market surplus coal.

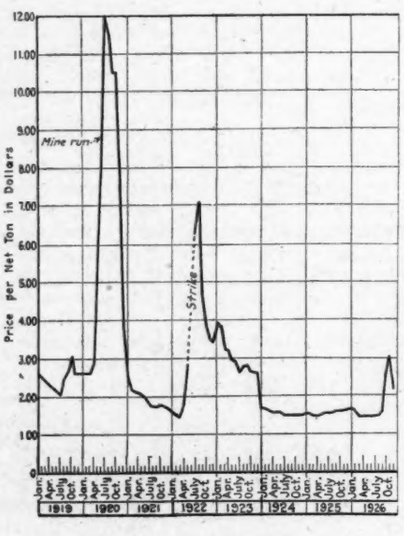
For inland delivery from Boston and Providence the price of Pocahontas and New River dropped to $5.25 in April, advancing to $11 during the bulge in early November, although several factors were taking care of regular trade at not over $9.50. The end of the year saw prices on the way down from $6.75 @$7. At retail in Boston the net ton delivered basis got down close to $6 for a short period in the spring, but with mounting costs at wholesale the open price advanced to $10.50, continuing at that figure to the end of the twelve months.

The wage increase we have only hinted at, but because it was effective exactly at the time prices began to recede it was a matter that assumed proportions during December. The "bonus" figured from 35@75c. per net ton, varying with local situations, and for the most part contract consignees agreed with differing degrees of civility. The fact that it did not apply when prices were mounting and did apply when they were falling almost hourly made it troublesome. In many cases it was not computed until after the market had completely settled down, but one of the large corporations here set the pace by accepting a stated increase on contract but only for November and December. It is the general impression that nothing beyond the 1917 scale will be paid on coal loaded at tidewater after Jan. 15.

Spot Prices, F.o.b. Mines, of Fairmont Coal (Pools 54-64), 1926

PHILADELPHIA MARKET

Month	Mine-Run	Month	Mine-Run
January	$1.64	August	1.48
February	1.62	September	1.59
March	1.45	October	2.64
April	1.45	November	3.10
May	1.45	December	2.18
June	1.45		
July	1.47	Yearly average.	1.79



Spot Prices, F.o.b. Mines, Mine-Run Coal, from Cambria, Somerset and Clearfield, 1926

BOSTON MARKET

Month	Cambria	Somerset	Clearfield
January	$2.35	$2.12	$2.00
February	2.39	2.19	2.08
March	2.28	2.10	2.01
April	2.15	1.97	1.88
May	2.11	1.97	1.85
June	2.09	1.92	1.81
July	2.03	1.95	1.80
August	2.07	1.95	1.85
September	2.36	1.99	2.21
October	3.31	2.90	3.04
November	3.50	3.22	3.08
December	3.02	2.82	2.66
Yearly average	2.47	2.26	2.19

Kentucky Coal Fields Push Ahead in 1926

The Louisville market has gone through a very good year and is looking forward to an even better one in 1927. It is expected that Kentucky's production tonnage for the past year was close to 60,000,000 tons, perhaps a trifle more. The fields operated profitably most of the year, were favored by good car supply, good non-union labor conditions, and a steady market. As a result of the non-union basis of operation Kentucky was able to absorb freight-rate differentials, which were against her, and still put out a big tonnage going north, in competition with fields with a much lower freight rate. Prices over the year were somewhat better than in 1925.

During the fall season when there was a heavy movement of coal to the lakes, and while the British strike was causing a large export movement from West Virginia, and the eastern side of the southeastern Kentucky fields, prices went up to around $6 for best grades of block, over a short period. At that time mine owners began advancing mine wage scales, jumping from the 1917 scale to about the 1919 level.

The lake movement stopped with cold weather, and with the British strike settled, export movement slumped, and prices dropped back to about normal. Now there is a movement to cut wages back to the 1917 scale, started in West Virginia, which will be followed in Kentucky, Virginia, and Tennessee.

Strip mining in western Kentucky failed to show the increased volume that it had in the previous two or three years.

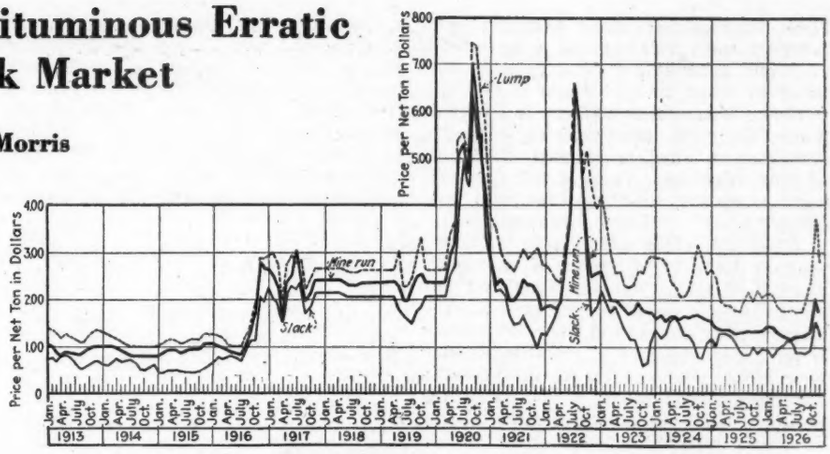
River coal movement into Louisville took on a fresh lease of life during the season, more coal coming by water than for several past years.

Louisville consumption which during war time was given at around 1,500,000 tons, is today said to be around 1,800,000 tons. The city has grown from around 250,000 to 315,000 people in the meantime, but many coal plants have been abandoned in favor of electricity, some of which is coming in from mine-mouth power plants, or hydro-electric plants.

Anthracite Active; Bituminous Erratic In New York Market

By R. W. Morris

Hard coal quickly makes up strike losses in 1926, with demand for domestic sizes strong until fall. Buckwheat breaks precedents. Anthracite and British strikes control soft coal.



Average Spot Prices, F.o.b. Mines, on Louisville and Chicago Markets, Of Coal from Western Kentucky

THE NEW YORK MARKET during 1926 was unsettled and at times inactive. While the hard coal strike extended for six weeks into the new year bituminous coal and coke were extremely active. Following the ending of the strike, however, there was a slump. The resumption of anthracite mining ushered in a demand for domestic sizes which was maintained steadily until the last two months of the year.

New York houses played a prominent part in the export situation brought about by the British strike. When the piers at Philadelphia and Baltimore became congested foreign shipments were made from this port.

The year began with no hard coal on hand, excepting small tonnages of No. 1 buckwheat which, to the surprise of nearly everyone in the trade, was, twelve months later, the only size that could be moved easily.

When the settlement of the strike was announced on Feb. 12 there resulted near-consternation in the trade. Telegram after telegram and telephone message after telephone message was received canceling orders for substitutes. Yards were already filled and consumers had either coke or soft coal in their cellars. Twenty-four hours after mining was resumed a week later the first shipment of hard coal arrived at New York's docks. This was quickly distributed and those dealers who had put in their bins a large supply of soft coal or coke found it difficult to dispose of the substitute fuels.

Dealers did not show any hurry about placing orders for anthracite. They were well supplied with coke and soft coal and wanted to dispose of those stocks before taking in large tonnages of hard coal. Because of this there was no rush of buyers at the anthracite company offices.

When shipments were resumed quotations on independent coals opened at $12@$14 for the domestic sizes, and the large companies reinstated approximately the schedule in effect on Sept. 1, 1925. There were no spring or summer discounts.

The movement of egg, stove and chestnut sizes was excellent, but the demand for pea coal astonished many of the trade. Contrary to the usual trend, this size continued in heavy demand throughout the summer and early fall and was followed by advances of 50c. per ton by two of the large companies. Demand expanded in September, following the return of vacationists to their city homes. Retail dealers were kept busy and coal was not so free because of the demand from Canada. The result of the educational campaign in the use of buckwheat for house-heating purposes also was bearing fruit. This size tightened considerably and became the feature of the market.

Lack of buying of the domestic coals caused weakness in independent quotations. The smaller mines curtailed production while some of the larger companies began storing certain of the domestic sizes. On the other hand, it became necessary for some companies to pick up No. 1 buckwheat to take care of their increasing orders for this size.

The last quarter of the year saw buckwheat featuring the anthracite market, with stove coal leading the demand for the larger coals and egg being broken by some companies in order to meet the demand for the smaller sizes.

New York bituminous, like all other Eastern centers, benefited through the anthracite and the British strikes.

Spot Price, F.o.b. Mines, Western Kentucky Coal, 1926

AVERAGE OF QUOTATIONS ON CHICAGO AND LOUISVILLE MARKETS

Month	Lump	Run of Mine	Screenings	Weighted Av. All Sizes
January	$2.14	$1.44	$0.93	$1.60
February	2.08	1.42	.79	1.54
March	1.81	1.29	.97	1.42
April	1.76	1.21	1.02	1.37
May	1.75	1.19	1.11	1.37
June	1.77	1.17	1.11	1.36
July	1.72	1.19	.88	1.31
August	1.72	1.19	.89	1.31
September	1.90	1.21	.85	1.38
October	2.35	1.28	.94	1.59
November	3.69	1.99	1.50	2.48
December	2.78	1.72	1.20	2.02
Yearly average	2.12	1.36	1.02	1.56

Average Prices of Bituminous Coal at New York by Months in 1926

	Pools 1	9	10	11	34
January	$2.85–3.25	$2.25–2.55	$2.00–2.30	$1.75–2.00	$1.50–1.70
February	2.90–3.25	2.40–2.85	2.20–2.45	2.00–2.25	1.50–1.70
March	2.60–3.00	2.10–2.45	1.80–2.10	1.60–1.90	1.40–1.60
April	2.50–2.85	2.15–2.35	1.70–2.00	1.50–1.80	1.35–1.55
May	2.50–2.75	2.00–2.25	1.70–2.00	1.50–1.75	1.30–1.55
June	2.50–2.75	2.00–2.30	1.75–2.00	1.60–1.80	1.30–1.55
July	2.50–2.75	2.00–2.25	1.75–2.00	1.60–1.80	1.30–1.55
August	2.50–2.75	1.90–2.25	1.75–2.00	1.60–1.85	1.35–1.50
September	2.40–2.75	1.90–2.25	1.75–2.00	1.55–1.80	1.40–1.55
October	2.75–3.00	2.40–2.60	2.25–2.50	2.10–2.25	2.50–2.75
November	3.75–4.00	3.50–3.75	2.75–3.00	2.50–3.00	2.50–3.00
December	3.60–4.00	2.60–2.85	2.30–2.65	2.20–2.40	1.75–2.20

Average Monthly Quotations for Independent Anthracite at New York Market During 1926

	Egg	Stove	Chestnut	Pea	No. 1 Buckwheat	Rice	Barley
January	*	*	*	*	*	*	*
February	*	*	*	*	*	*	*
March	$10.00–$11.25	$10.25–$11.50	$10.25–$11.40	$6.50–$8.00	$2.60–$3.25	$2.00–$2.25	$1.50–$1.75
April	9.25–10.25	9.25–10.25	8.50–9.25	6.25–7.00	1.75–2.25	1.50–2.00	1.25–1.50
May	8.75–9.25	9.25–9.75	8.75–9.25	6.25–7.00	1.70–2.50	1.40–2.00	1.25–1.50
June	8.50–9.25	9.25–9.75	8.50–9.25	6.25–7.00	1.70–2.25	1.40–1.85	1.10–1.50
July	8.35–8.75	9.25–9.70	8.25–8.85	6.00–6.50	1.50–2.25	1.25–1.85	1.10–1.60
August	8.60–9.00	9.00–9.50	8.35–8.80	6.00–6.50	1.75–2.25	1.30–1.80	1.10–1.40
September	8.75–9.25	9.25–9.50	8.75–9.25	6.00–6.50	1.80–2.25	1.90–2.00	1.20–1.50
October	9.00–9.25	9.50–10.00	9.25–9.50	6.00–6.50	2.00–2.50	1.80–1.90	1.20–1.50
November	8.75–9.25	9.50–10.25	9.25–9.75	6.00–6.50	2.25–2.75	1.50–1.75	1.25–1.50
December	8.25–9.25	9.25–10.00	9.25–9.75	6.00–6.50	2.35–2.75	1.65–2.00	1.50–1.75

*Quotations withdrawn because of strike.

New Yorkers had their first real experience with soft coal as a household fuel and although it was difficult for them to learn how to burn it the experience was worth while. A canvass made early in the year by Health Department officials showed that out of 7,097 families visited 2,167 families were using soft coal and that coke was being burned by 1,004 families.

When the anthracite strike was settled on Feb. 12 shippers of soft coal were hard-hit by cancellations and the quotations for coke dropped several dollars over night. At the time there were several hundred cars of Pocahontas and New River coals on tracks in the metropolitan area, most of it on Long Island. This was later absorbed by the railroads but at a much lower price than when originally sold.

MARKET "SHOT TO BITS"

The soft coal market was "shot to pieces" early in March. Coal was more than plentiful and this tonnage was being augmented almost daily by several cargoes of foreign coal and coke in this port. During the duration of the anthracite strike reports show that upwards of 750,000 tons of foreign coal and coke, most of it anthracite, reached the New York piers.

At various time the New York piers were congested. Shortly after the resumption of mining in the hard coal fields, there was at one time about 250 boats loaded with soft coal at anchor waiting for buyers. Nevertheless shippers showed no inclination to make sacrifices and the prices remained practically within the same range most of the twelve months.

Not long after the start of the British strike in May shippers of coal for export began receiving inquiries. Orders increased and with the supply of coal in foreign ports becoming scarcer vessels leaving the port of New York took on return cargoes of coal. Domestic industrial buyers were temporarily aroused early in June by the increasing demand from foreign countries, but after surveying the situation decided there was no immediate cause for alarm and refused to buy more than their current requirements. Railroads, however, picked up considerable tonnage at low prices.

When demand for Southern coals for export became heavy, New England buyers entered the central market for central Pennsylvania coals. Late in October these same coals were wanted for export purposes and heavy tonnages were sent to Philadelphia and Baltimore for that purpose. At times the congestion at these ports became so heavy that coal was transferred to New York and shipped overseas.

PEACE WITH CANCELLATIONS

The ending of the British strike resulted in heavy cancellations causing an oversupply of free coals in the harbor. This surplus was not cleaned up when the mines closed down over the holiday season.

Shippers, however, ended the year hopeful of the future and feeling that early in the New Year consumers, fearful of the strike possibilities, would begin buying and that prices would be better.

Excluding the first two months of 1926, during which time the anthracite miners were on strike, and December, there were exported from the Port of New York, 96,896 tons of anthracite, as compared with 71,533 tons shipped to foreign countries during the first nine months of 1925. Shipments of bituminous coal the first eleven months of 1926 totaled 77,563 tons as compared with 14,028 tons the twelve months of 1926. Of the bituminous shipments 50,655 tons were sent abroad in November. Coke shipments for the first eleven months of last year were 3,883 tons as against 5,140 tons the twelve months of 1925.

Shipments by months follow:

Exports from New York by Months

Month	Anthracite 1926 Gr. Tons	Anthracite 1925 Gr. Tons	Bituminous 1926 Gr. Tons	Bituminous 1925 Gr. Tons	Coke 1926 Gr. Tons	Coke 1925 Gr. Tons
January	.....	3,302	2,219	792	161	120
February	.....	840	200	40	714	1,734
March	650	4,953	54	526	77	187
April	3,609	3,965	4,570	1,835	431	1,202
May	11,572	8,315	682	359	63	82
June	15,182	10 689	2,212	296	35	54
July	15,588	17,371	4,694	1,819	278	60
August	15,430	14,780	2,472	2,754	104	1,341
September	11,143	7,309	9,246	1,783	1,077	27
October	13,083	†	559	1,049	84	115
November	10,639	†	50,655	339	859	99
December	*	†	*	2,436	*	119
Total	96,896	71,533	77,565	14,028	3,883	5,140

* Data not available.
† No shipments because of strike.

Alabama Mines Break Production Record; Demand in Healthy State

By H. B. McLaurine

Satisfaction marks course of development in Birmingham district in 1926. Production well controlled and prices are highly stabilized. Byproduct ovens active.

THE ALABAMA MARKET, in all essential respects, had a very satisfactory year. The volume moved was, of course, far below the potential capacity of the field, but exceeded the record of any previous year. The demand for medium and quality coals properly prepared was good throughout the year, buying slowing down only slightly through the summer months.

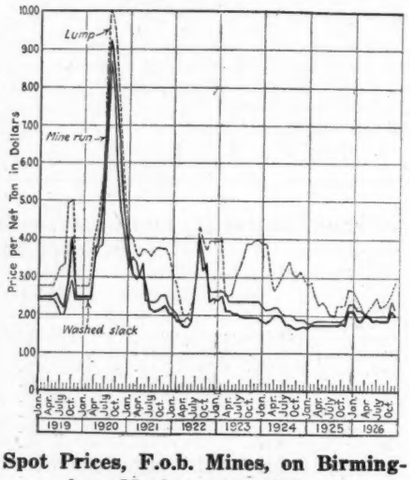
Inquiry opened up early in the year and the spot business was taken on, supplemented by contract commitments, kept mines operating on good schedules through the first three months. Even cheaper grades were in good demand until the latter part of March. During the contracting period new fuel agreements replaced the old ones as they expired, and in most instances at a fair increase in price as compared with the previous year. There was no hesitancy on the part of consumers in negotiating renewals, but the usual class of hand-to-mouth buyers continued to supply their requirements in the open market, and during the second and third quarters spot demand was semi-active and at times the lower grades moved very sluggishly.

New railroad fuel contracts equaled, or exceeded the quantities called for in old agreements. In fact, carriers, industrial plants and coke ovens took an unusually large tonnage throughout

Spot Prices, F.o.b. Mines, of Big Seam (Alabama) Coal, 1926

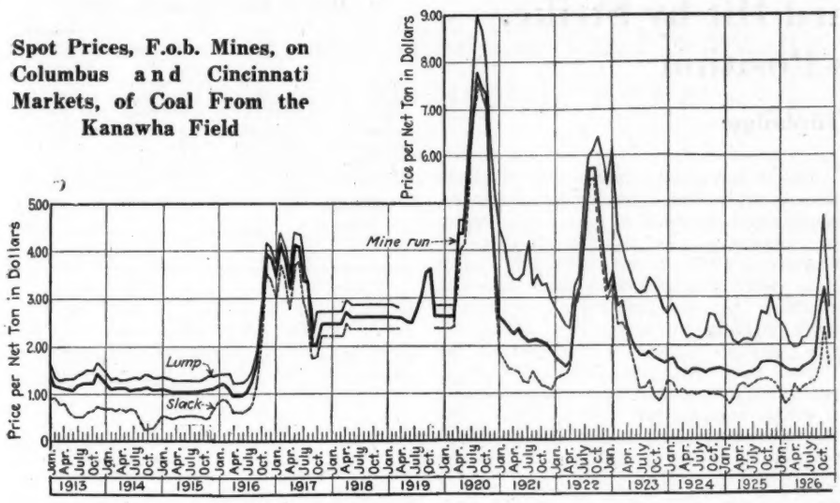
BIRMINGHAM MARKET

Month	Lump	Run of Mine	Washed
January	$2.75	$2.13	$2.30
February	2.56	1.84	2.16
March	2.28	1.81	2.16
April	2.00	2.00	2.06
May	2.16	2.00	2.00
June	2.30	1.88	2.00
July	2.49	1.90	2.00
August	2.25	1.88	2.00
September	2.28	1.88	2.01
October	2.40	1.88	1.99
November	2.60	2.13	2.38
December	2.88	2.00	2.19
Yearly average	2.41	1.90	2.10



Spot Prices, F.o.b. Mines, on Birmingham Market, of Coal from Alabama Fields

Spot Prices, F.o.b. Mines, on Columbus and Cincinnati Markets, of Coal From the Kanawha Field



Spot Prices, F.o.b. Mines, Southern West Virginia High-Volatile Coals, 1926

AVERAGE OF QUOTATIONS ON COLUMBUS AND CINCINNATI MARKETS

Month	Lump	Run of Mine	Slack	Weighted Av. All Sizes
January	$2.51	$1.59	$0.96	$1.76
February	2.34	1.50	.72	1.61
March	2.09	1.46	.84	1.54
April	1.96	1.47	1.16	1.53
May	1.99	1.44	1.01	1.54
June	2.13	1.51	1.09	1.62
July	2.18	1.58	1.12	1.67
August	2.34	1.63	1.18	1.76
September	2.67	1.76	1.22	1.93
October	3.49	2.66	1.58	2.61
November	4.70	3.20	2.36	3.49
December	2.78	2.12	1.58	2.22
Yearly average.	2.60	1.83	1.23	1.94

the year and stimulated production materially when inquiry and sales were light in the open market.

WASHED COALS STAND HIGH

Washed coals held a favored position in the trade. Grades suitable for coke making were used in large quantities. Heavy shipments were required to fill industrial, utility and bunker commitments. The bunker trade held up well through May, was semi-active in the summer, and increased again in September.

No stimulating effects were felt in this market as a result of the British strike until early in November, when congestion and delay in the loading of export coal at the eastern ports caused the diversion of foreign vessels to Pensacola for their cargoes and orders were placed in this market for approximately 250,000 tons of export fuel for delivery through November and early December. Cessation of inquiry promptly followed the resumption of work at the British mines.

Producers observed more rigidly than ever before the policy of holding output approximately near the point of trade absorption and surpluses were held to a minimum, thus maintaining a degree of price stability not heretofore known.

Sales of domestic coal were good during the first quarter slowing down only near the close of the period awaiting spring and summer schedules effective April 1. Contracting at the new figures was very liberal on all but the white ash coals, which are not in great demand for stocking. Shipments against contracts continued on a healthy basis until the dealers were well stocked.

Spot buying through the summer was negligible and producers were hard put in disposing of output during this period. Contract hold-ups were gradually released in the late summer and these deliveries, supplemented by a drift of spot orders, enabled the mines to move domestic sizes with reasonable dispatch. The flurry in the commercial market in November stimulated the domestic trade for a short period, and home demand augmented by outside inquiry taxed production and forced prices to a slightly higher leyel. Unreasonable weather conditions during the last six weeks of the year brought about a very slack demand for even the best grades.

The progress of the industry during 1927 hinges entirely on the extent to which industrial activity revives and continues through the year. The outlook at present is optimistic from a general standpoint, but new business is slow in coming in. On the other hand, consumers holding contracts are taking coal in a very satisfactory volume and stocks in the hands of users are negligible.

From a production standpoint the industry is in fine shape. Labor conditions are satisfactory, the supply being adequate at present and amicable relations exist between employer and employee under the fixed open-shop policy. Much progress has been made in providing modern equipment for the mining, handling and preparation of coal at the mines, and the district is now in position to furnish an adequate supply of clean product of any grade and size required in the trade.

Transportation conditions are all that could be desired and port facilities have been provided at Pensacola which should result in a greatly increased movement through that port of bunker and export fuel. The Frisco system will reach this port over its own rails early in the year and has also provided for a Mobile connection, which will afford a direct route from the many mines served by this line in the Walker County field.

An unusually good market for commercial coke was maintained throughout 1926. Demand for the greater part of the time was very strong for foundry grades. Although production was kept at practically capacity by byproduct plants, it was necessary at times to temporarily operate beehive ovens. Furnace operations were continuous and much coke of this class was required.

COKE MARKET EXCELLENT

Domestic sizes were brisk during the first quarter, but had a very restricted call through the summer months. The buying movement was revived to a limited degree in the fall. However, due to unseasonable weather conditions in both home and foreign territory usually consuming a large quantity of this product, there was no pressing demand during the greater part of the year.

Quotations ranged from $5.50 to $6.50 on contract and $5.50 to $7 for spot foundry. Egg coke was $4.75 to $6.50; stove, $4 to $4.75 and nut $3.50 to $4.25, f.o.b. ovens.

Production for the year cannot be closely estimated, but will approximate the make of 1925, which was 4,608,639 tons.

Convict Mining System to Go.—No time will be lost by Governor Bibb Graves of Alabama in carrying out its plans for removal of convicts from mines where they are now employed digging coal, if present plans to remove 400 convicts from the Flat Top mine are carried out. The plan is to move the 400 to the Speigner prison cotton mill, operated by the state, during February. This action was decided upon following a survey of conditions in convict mines by a group of expert investigators.

Average Range of Coal Prices at Birmingham in 1926

	January			April		
	Mine-Run	Washed	Lump	Mine-Run	Washed	Lump
Big Seam	$1.75@$2.00	$2.00@$2.25	$2.50@$3.00	$1.75@$2.25	$1.75@$2.25	$1.75@$2.25
Carbon Hill	2.00@ 2.25	2.25@ 2.50	3.25@ 3.50	1.90@ 2.25	1.90@ 2.25	2.50
Cahaba	2.25@ 2.50	2.25@ 2.75	4.25@ 5.50	2.40@ 2.65	2.25@ 2.60	3.50@ 4.00
Black Creek	.....	2.80@ 3.25	5.00@ 5.50	2.75@ 2.85	2.75@ 3.00	3.50@ 3.75
Corona	2.50	2.75	4.00	2.25	2.50	2.75
Pratt	2.25@ 2.50	2.25@ 2.50	.....	2.00@ 2.50	2.00@ 2.50	.....
Montevallo Seams	.....	.....	5.50@ 6.25	.....	.....	4.25@ 4.75

	September			December		
	Mine-Run	Washed	Lump	Mine-Run	Washed	Lump
Big Seam	$1.75@$2.25	$1.85@$2.25	$2.25@$2.50	$1.75@$2.00	$2.00@$2.25	$2.75@$3.00
Carbon Hill	1.85@ 2.00	1.90@ 2.25	2.75@ 3.25	2.00@ 2.25	2.25@ 2.50	3.50@ 3.75
Cahaba	2.25@ 2.50	2.25@ 2.75	4.50@ 5.00	2.25@ 2.75	2.50@ 2.75	5.00@ 6.00
Black Creek	2.75@ 3.00	2.75@ 3.00	4.50@ 4.75	.....	2.75@ 3.25	5.00@ 5.50
Corona	2.25	2.50	3.50	2.75	3.60	4.00
Pratt	1.90@ 2.25	1.90@ 2.25	2.00@ 2.25	2.00@ 2.25	.....	.....
Montevallo Seams	.....	.....	5.25@ 5.75	.....	.....	5.75@ 6.75

British Industry Hard Hit by Strike, But Betters Position

By C. H. S. Tupholme

Coal operators win big victory in district agreements with lengthened working day. Industry, however, must fight for foreign markets lost during strike.

THE NATIONAL stoppage reduced the total activity of the British coal trade in 1926 to less than six months. From the beginning of May to early December production was suspended except at a few pits in the Midlands area, which returned to partial operation before the strike was ended. It is no exaggeration to say that the last year was one of the most disastrous not only to the coal industry but also to industry throughout Britain. The history of the strike is familiar to American readers and little would be achieved by going over the ground afresh.

Prices, which were quotable only from January to May, and during part of December, were naturally under the influence of the strike, though the lowest prices were obtained in the first quarter of the year when the government subsidy was still in force. March saw an increase in some cases owing to fear of a stoppage, and in April prices went still higher when it was obvious that a stoppage was inevitable When market quotations were resumed in December prices saw their highest level of the year, but from then they began to fall steadily.

Bunker prices abroad showed big increases, especially towards the end of the strike. Thus, at the end of November, bunkers at most of the northern European ports brought from 60 to 70; 80s was quoted at Gibraltar, and at the Mediterranean ports anything from 70 to 100. At South American ports the prices were from 85 to 99.6.

The embargo on exports was removed Dec. 8, and after that foreign business, which had been at a standstill, began to increase. At the beginning of January, 1927, about 3,000,000 gross tons were being produced per week, supplies were plentiful, and stocks were waiting to be shipped. Many in the industry predict a big demand for Brtish coal this year, and, if that is the case, prices will be maintained and German competition will be felt. The German operators have attempted to establish their position by selling heavy quantities ahead, but, if the big demand does not come along, the Germans will be disappointed.

Domestic consumers are anxious to get on with their pre-stoppage contracts and to buy fresh British coal. On the other hand, many of them have contracted for foreign coal and have still fairly considerable quantities to come. Most of them are trying to cancel the balance of their orders or to resell, though they are finding great difficulty.

One of the greatest difficulties in the way of normal resumption of activity at the pits is the lack of transport. During the importation of foreign coal, many of the coal cars got out of their normal areas, and considerable difficulty is being experienced in discharging coal cargoes and also in getting cars to take the coal away from the pits. In more than one case lately ships have been waiting a month for discharge. This lack of proper transport facilities will mean idle time at the pits until foreign coal ceases to come to British ports.

Once the strike was over district settlements were arranged early in December with promptitude and with a surprising amount of goodwill. These terms of settlement are important as regards their bearing on the future of the industry and, if they are loyaly abided by, they should go very far towards restoring the coal industry to an economic basis.

In the first place, the working day has been extended in every district, either by an hour or half hour. The balance favors the 8-hr. day arranged by districts, and counting the number of men employed in each district as in March before the strike, and not as now actually employed, the result is shown in the accompanying table:

Eight Hours

	Miners employed before the strike.
Scotland	126,500
South Wales	215,800
Lanc., Cheshire & N. Wales	115,000
Staffs, Worcester, Warwick	91,300
Somerset, Forest of Dean, etc.	27,000
	575,600

Seven and a-half Hours

Northumberland	57,300
Durham	157,300
Yorkshire	189,300
Nottingham & Derbyshire	132,200
	536,100

In Northumberland and Durham the hewers, on piece rates, are working seven and one-half hours, and the other underground workers, 8 hours. If the hewers be taken as 40 per cent of the underground workers, this would mean that 128,400 men in this district are working eight hours. This raises the number of men at eight hours to 704,200 and lowers the seven and one-half hour men to 407,700.

The wages terms in brief follow:

Scotland: 1924 minimum, 133.3 per cent on the standard; minimum wage 9/4 per day until April 30, thereafter 110 per cent; agreement for three years, with two months' notice.

South Wales: Minimum of 42.22 per cent on the standard; April wage will continue to the end of February, 1927, after which the new minimum of 28 per cent on the standard will operate; all other allowances to men on second shift, house coal, etc., continue as before; three years agreement with notice of one month.

Northumberland: Minimum of 90 per cent on the standard; seven and one-half hours for hewers and eight hours for other men.

Durham: Minimum of 100 per cent on the standard.

Lancashire and Cheshire: Minimum of 46.47 per cent on the standard; new agreement provides for a sliding scale falling to 60 per cent in June, July and August, 1927.

Yorkshire: Minimum of 46.67 on the standard; from February to December, 1927, minimum 36 per cent after December, 32 per cent.

A significant development is the grouping of collieries, now going on steadily under private initiative, and thus carrying out the recommendations of the Coal Commission without legislation. Chief of these are the developments effected and pending in the South Wales anthracite region.

British Coal Imports, 1926

	Tons	Value £	Average c.i.f. price £ s. d.
May	3,618	5,983	1 13 1
June	600,634	966,290	1 12 2
July	2,319,657	4,147,995	1 15 9
August	3,970,442	7,542,847	1 17 11
September	4,940,880	7,749,101	1 19 4
October	3,489,083	7,722,940	2 4 3
November	3,467,921	9,037,254	2 12 1
Total for strike period	17,794,701	37,177,033	

Exports, Bunker Shipments and Output of British Collieries in 1926

(In Gross Tons)

1926	Output	Bunker Shipments	Cargos Export	Cargo Export Values £	Cargo Export Price, f.o.b. Average Per Ton s.	d.
January	23,354,143	1,280,331	4,148,042	3,821,336	18	5
February	21,583,771	1,306,467	4,340,006	4,025,627	18	6½
March	23,245,643	1,378,205	4,702,536	4,184,079	17	9½
April	22,049,543	1,293,038	4,290,652	3,767,909	17	6½
May	.....	584,676	1,448,368	1,392,437	19	2½
June	.....	182,750	34,485	37,818	21	11
July	.....	154,307	7,381	7,708	20	10½
August	.....	148,134	2,184	3,422	31	4
September	.....	183,709	5,225	4,120	25	4
October	.....	161,873	3,812	2,408	12	8
November	2,324,000	217,649	5,111	5,724	22	4
Total for 11 months	112,557,060	6,891,139	18,987,802	17,252,588	—	—
Total for 1925	244,430,886	16,437,648	50,817,118	50,477,211	19	1½

Activity in Franco-Belgian Coal Markets Influenced by British Strike

By Victor Truant

Prolonged suspension of British mining proves boon to Belgian and French operators in 1926. Prices skyrocket. Outlook for 1927 less promising.

THE BRITISH STRIKE exercised a predominating influence upon the coal trade of Continental Europe during 1926. In both France and Belgium production, estimated from the latest available figures, exceeded the prewar averages. In the case of the former country, the output also was ahead of 1925.

At the beginning of the year sales of French industrial coals were accelerated by the falling franc. Manufacturers thought it wiser to turn their currency into commodities than to risk further depreciation in monetary values. On the domestic side of the market, buying interest was waning and, had it not been for the British situation, reductions would have been in order on April 1.

The actual suspension of mining at the British pits, however, stirred up the distributors of household fuel and by mid-July retail depots were so heavily stocked with coal that buying of domestic sizes languished for the rest of the year. Of course, the British strike threw a heavy burden of industrial demand upon the French mines, but even their increased output was not sufficient to quiet fears of a coal famine and the coastal regions turned to German coal to replace the British product.

Naturally this rising demand had a marked effect upon the mine labor situation in France. Taking the Nord and Pas-de-Calais basin as typical, the situation with respect to wages may be summarized as follows:

Prices and Wages Boosted

On Jan. 16 the temporary additional wages allowed to cover the increased cost of living were advanced from 40 to 100 per cent, raising the pay of wages of the best paid workers approximately 6 fr. per day. Prices on industrial coals were increased 4 fr. per ton to cover this advance.

On May 16 basic wages were advanced 10 per cent and the temporary allowance 15 per cent. On Aug. 16 base rates were increased 15 per cent and another boost was given to the temporary allowance. Three months later a fourth increase was granted, which put up both base and temporary rates 40 per cent. In each case, prices also were increased to cover the higher wage rates.

Coal prices were further raised during the course of the year because of industrial conditions, increased cost of supplies and advances in transport rates. The net result of these various changes, comparing Nov. 16 with Jan. 1 prices, was increases of 36.40 to 132.60 fr. in industrial coals, and 47.40 to 130.60 fr. in domestic bituminous coals.

The total French production for the year, based upon figures for the first ten months, will approximate 52,000,000 metric tons, as compared with 48,000,000 tons in 1925 and 42,000,000 tons in 1913. The 1913 total, however, was exclusive of production from the Lorraine mines which last year produced approximately 5,400,000 tons.

Imports Fall, Exports Rise

Imports for the first ten months of 1926—13,064,000 tons—declined 2,192,000 tons. Exports during the same period were 3,836,000 tons, as compared with 3,691,000 tons for the corresponding period in 1925. With British shipments practically suspended after May 1, France turned to Germany for 5,928,000 tons in ten months, Belgium for 2,102,000 tons and Holland for 699,000 tons. In the corresponding period in 1925 imports from Germany were 4,582,000 tons; from Belgium, 1,551,000 tons and from Holland, 464,000 tons. Poland also shipped a larger tonnage, but receipts from the United States declined.

French consumption for the year was estimated at 76,000,000 tons.

On the whole, the market situation in Belgium closely paralleled that in France. These differences, however, should be noted. The inland market is of relatively less importance to Belgium so that the pressure upon the Belgian mines for home consumption was less. Moreover, at the opening of the year, the Belgian exchange was in better shape and this permitted German and British competition in the Belgian markets to a greater degree than was the case in France during the same period.

For the Belgians, therefore, the British strike took on the aspect of a providential incident. As soon as the British imports were cut off, the domestic industrial market re-established itself, strengthened and showed a rising tendency which was accentuated from month to month as the tie-up at the British mines continued.

Until the moment the Belgian government took steps to protect home consumption against the increasing drain of Belgian production to foreign countries the Belgian collieries made a determined drive upon the coal markets of neighboring states which ordinarily relied upon Great Britain for their fuel supplies. Many Belgian mines which for several years had been unable to market capacity production, were pushed to the limit in supplying these foreign buyers.

During the first ten months of the year, Belgium produced 20,652,000 metric tons of coal. This was a monthly average of 2,065,000 tons, as compared with a monthly average of 2,174,000 tons in 1925 and 1,903,000 tons in 1913. On Oct. 1 stocks on hand had fallen to 117,340 tons, as compared with 667,620 tons on Dec. 31, 1925, and 955,890 tons on Dec. 31, 1913.

Belgium imported 6,408,000 tons of coal during the first ten months of 1926. Included in this total were 3,349,000 tons from Germany, 1,500,000 tons from Holland, 902,000 tons from France and 658,000 tons from Great Britain. During the corresponding period in 1925 the imports totaled 7,404,000 tons, of which 3,427,000 tons came from Germany, 1,989,000 tons from Great Britain, 1,073,500 tons from Holland and 915,000 tons from France.

In the same ten months in 1926 Belgium exported 3,158,000 tons, as compared with 2,155,000 tons during the corresponding period in 1925. France was the biggest customer, taking 2,022,000 tons, as compared with 1,726,000 tons in 1925.

Unlike France, Belgium started the year with a 3 per cent decrease in wages effective Jan. 7. Beginning in May, however, there were monthly increases of approximately 5 per cent until Aug. 15, with increases in selling prices of coal to compensate the producers for the higher wages to the workers. As a result of these and other changes, industrial coal prices were 95 to 140 fr. higher on Dec. 1 than on Jan. 1, 1926; house coals were up 50 to 115 fr. and briquets had jumped 300 to 325 fr.

Year Adjudged Favorable

Taking the year as a whole, 1926 has been an exceptionally favorable one for the Franco-Belgian coal industry. If, at the beginning of the period, there was some softness, since the British strike sales generally have been the highest ever known and prices have reached record levels.

The outlook for 1927, however, is not so promising. Consumers are no longer content to bow to every act of the industry boosting prices. The resumption of British mining will help the consumer in his fight. Moreover, the financial situation is not conducive to large-scale consumption of fuel. It is a time of caution and hand-to-mouth activity. While Great Britain is expected to make a determined fight to recover her markets in France and Belgium, she will have to meet the equally determined resistance of Germany, Holland, Poland, and even Russia.

Italy to Get Coal Shipments Via Antwerp

The Italian Government has signed a contract with the State Railways of Belgium for the transport of 300,000 tons of coal from the Ruhr via Antwerp, according to a report to the Department of Commerce from Trade Commissioner J. E. Wholean, Rome. The railroad has granted the same tariff which would be applied if shipment were made by boat through the Rhine.

Canadian Coal Industry Improves Position in 1926

By S. J. Cook

Chief of the Mining, Metallurgical and Chemical Branch, Dominion Bureau of Statistics, Ottawa, Canada

Output up 3,000,000 tons and consumption gains over 4,000,000 tons. Imports of British coal hit by strike. Outlook promising.

Those unfamiliar with the Canadian coal mining industry may be surprised to learn that more than 400,000,000 tons of coal have been taken from Canadian deposits to date. It may further be of interest to note that official estimates place Canada's coal reserves at approximately 16 per cent of the world's supply. But as Canadian coal mines are located in the maritime provinces of Nova Scotia and New Brunswick on the east, and in Saskatchewan, Alberta and British Columbia on the west, the great central region, which is more thickly populated and highly industrialized, has always been a profitable market for imported coal.

In 1926 Canada produced 16,100,000 tons of coal, exported 900,000 tons, imported from the United States 17,120,000 tons and from other countries 400,000 tons, and thus had available for consumption a total of 32,725,000 tons, including 4,020,000 tons of anthracite, 24,960,000 tons of bituminous, 401,000 tons of sub-bituminous, and 3,344,000 tons of lignite. Final statistics for 1925 showed that the total consumption of coal in Canada in that year was actually 28,460,000 tons or an average of 3.039 tons per capita.

Nova Scotia mines produced 6,810,000 tons of coal in 1926. This was a greater tonnage from these mines than in any previous year with the exception of 1916 when the output amounted to 6,912,140 tons. These figures furnish a marked contrast to the output of 3,842,978 tons in 1925 but in that year a strike of about four months materially reduced the output.

New Brunswick's coal mines produced 168,000 tons in the year, marking a slight recession from the 208,012 tons produced in 1925.

Bituminous coal only is produced in Nova Scotia and New Brunswick. Employment in the coal mines of the maritime provinces was comparatively steady throughout the year, with a slightly upward trend.

In the Western field, the province of Alberta is the greatest producer and in 1926 the mines of this province yielded 6,117,000 tons of coal including 2,960,000 tons of lignite, 2,750,000 tons of bituminous coal and 400,000 tons of sub-bituminous.

Saskatchewan produced 376,000 tons of lignite. In the prairie provinces there is a seasonal decline in the production of coal during the summer months when many of the small mines are shut down so that their owners may engage in the more profitable industry of growing wheat.

British Columbia, mining bituminous coal only, produces about a quarter of a million tons per month, and in 1926 showed an output of 2,634,000 tons. A large part of British Columbia's output goes to export trade, and the remainder is used within the province, very considerable quantities being consumed in the several metallurgical works and other industrial enterprises.

Although Canada drew most of its supply of imported coal in 1926 from the United States, it did import about 350,000 tons from other countries, including about 275,000 tons from Great Britain and the rest, in almost equal amounts, from Germany and the Netherlands. The figures for imports of coal mined in countries other than the United States may even be slightly higher than those quoted because during the year some European coal received at United States ports eventually found its way into Canada.

Development of coal trade between Canada and Great Britain had its inception during the strike at the anthracite mines in the United States, but the long drawn out suspension in British mining in 1926 was a retarding factor in this newly developed trade. During the past five years, however, Canada has imported from Great Britain a total of 2,540,000 tons of coal, including 1,540,000 tons of anthracite. A new feature of Canada's import trade in coal last year was the receipt of shipments from Germany and the Netherlands. This was nearly all classed as anthracite, although it included some briquetted coal.

Exports of Canadian coal were about equally divided between the Eastern and Western coal fields. In all about 900,000 tons were shipped to points outside the Dominion. Canada's chief customers are Newfoundland and the United Kingdom on the east, and Alaska, points in the United States, the Philippines, and Australia on the west. Smaller quantities are exported each year to a great many other places.

Interest in the production of by-product coke as a domestic fuel has been cultivated in Canada as a part of the educational program inaugurated when a shortage of imported coal supplies became acute. Much more coke has been used for domestic heating during the past year than previously, and as the people became accustomed to burning this fuel, many developed a preference for it, with the result that less dependence is placed on the supply of anthracite. The production of coke during 1926 from Canadian ovens was close to 2,000,000 tons in addition to which upwards of 1,000,000 tons were imported. The largest market for this product naturally continues to be found in metallurgical works.

At the close of 1926 Canada's coal mining industry appears to be in an appreciably better position than for several years. Industrial conditions generally show marked improvement and the outlook for the industry in 1927 appears promising.

Bituminous Coal Loaded Into Vessels at Lake Erie Ports During Season of Navigation

(In Net Tons)

Ports		1926 Cargo	1926 Fuel	1926 Total	1925 Cargo	1925 Fuel	1925 Total	1924 Cargo	1924 Fuel	1924 Total
Toledo	Hocking Valley	7,261,073	210,940	7,472,013	8,234,057	239,377	8,473,434	6,714,573	199,104	6,913,677
	Big Four	1,827,893	13,054	1,840,947	1,542,343	9,398	1,551,741	57,298	138	57,436
	N. Y. C.-Ohio Central Lines	2,175,088	110,638	2,285,726	1,016,892	74,669	1,091,561	145,012	5,425	150,437
	Baltimore & Ohio	2,473,901†	71,001	2,544,902	3,219,638	96,902	3,316,540	2,256,187	69,919	2,326,106
Sandusky	Pennsylvania	6,780,430	195,325	6,975,755	6,122,103	183,699	6,305,802	4,205,493	126,145	4,331,638
Huron	Wheeling & Lake Erie	627,547	32,613	660,160	703,627	36,721	740,348	800,037	36,933	836,970
Lorain	Baltimore & Ohio	2,077,090	144,913	2,222,003	1,588,520	156,970	1,745,490	2,227,761	158,610	2,386,371
Cleveland	Pennsylvania	536,357	176,108	712,465	390,050	172,653	562,703	1,414,865	176,709	1,591,574
	Erie				18,138	1,252	19,390	327,720	11,336	339,056
Fairport	Baltimore & Ohio	674,665	90,345	765,010	969,013	114,520	1,083,533	556,243	84,556	640,799
Ashtabula	New York Central	244,610	109,146	353,756	331,047	83,397	414,444	871,569	113,659	985,228
	Pennsylvania	1,055,538	77,863	1,133,401	786,745	88,032	874,777	1,195,466	79,607	1,275,073
Conneaut	Bessemer & Lake Erie	1,893,488	260,516	2,154,004	1,124,109	214,425	1,338,534	1,514,457	198,039	1,712,496
Erie	Pennsylvania	531,396	92,316	623,712	284,561	60,138	344,699	688,310	87,381	775,691
Total		28,159,076	1,584,778	29,743,854	26,330,843	1,532,153	27,862,996	22,974,991	1,347,561	24,322,552
Storage Loading		60,142*	774	60,916	33,017*	1,048	34,065	182,060*	4,940	187,000

*Coal loaded into vessels in December of previous year, after close of navigation, and forwarded from Lake Erie Ports during year indicated.

†Includes 1,306 tons cargo coal dumped at N. Y. C.-O. C. L. dock.

Compiled by Ore & Coal Exchange, Cleveland, Ohio; H. M. Griggs, manager

News Of the Industry

Union Meets to Frame Wage Demands; Unofficial Opinion Is That Retention Of Jacksonville Rates Will Be Asked

By Sydney A. Hale
Associate Editor, *Coal Age*

Indianapolis, Ind., Jan. 25.—Deliberations which will culminate in the formulation of wage demands in the Central Competitive Field and outlying unionized bituminous districts were started at Tomlinson Hall this morning when the thirtieth convention of the United Mine Workers got under way. The actual framing of the demands to be presented to the operators next month will be in the hands of the scale committee appointed at this convention present indications this committee will by President John L. Lewis. From not report to the delegates assembled here until some time next week.

In advance of the presentation of this report responsible officials of the union decline to discuss what the wage policy of the organization will be. Unofficial observers of the proceedings, however, are inclined to the belief that the union will authorize its negotiating committee to ask the bituminous operators to continue the basic rates now carried in the Jacksonville agreement, which expires March 31. In view of the persistent refusal of the union to consider any revision of the agreement which would imperil these rates, it is considered extremely unlikely that Mr. Lewis and his associates will now reverse themselves.

Cool to Sliding Scale

If this forecast is correct, the sliding scale scheme which has been advocated in some quarters not identified with the labor organization and which was touched upon in a number of the newspaper reports of the recent Toledo meeting of the operators will meet with a cool reception from the mine workers. The proposal that wages should fluctuate with coal prices has been criticized severely by union leaders in the past and probably, indirectly at least, will be condemned before the present convention is over.

Those who recall the settlement of the anthracite strike last year are wondering whether the union will propose another long-term agreement carrying revision provisions similar to those incorporated in the anthracite contract signed last February. Upon this suggestion, as upon all others bearing upon wage policies, Mr. Lewis and his fellow officers, however, preserve an unbroken silence.

"I deem it advisable," said Mr. Lewis, "to withhold any specific recommendations on wage questions and policy until the scale committee has had the opportunity to sort the resolutions which have been submitted on these matters, canvass the situation and submit its report to the convention."

That the officers contemplate no retreat from their present position, however, might be read between the lines in the reports of Philip Murray, vice-president, and Thomas Kennedy, secretary-treasurer. "The time has passed when labor has to be regarded as a commodity and wages regulated in the same fashion as prices of coal, iron, steel and other commodities," asserted Mr. Murray in characterizing the wage question as the most important one before the convention.

"High Wages Mean Prosperity"

"The economic policies of our organization have stood the test of time," declared Mr. Kennedy. "When President Lewis, at the tri-district convention in 1921, enunciated the program of 'no backward step'—which meant no wage reduction—he really sounded the clarion call to all labor in the United States. His declaration that high wages meant greater prosperity has been vindicated by time, and today in America practically all men with vision or foresight are concurring in and advocating the policies of the United Mine Workers of America."

The morning session was taken up with routine organization matters and the appointment of committees on rules and order, credentials, appeals and grievances, resolutions, scale and transportation.

P. T. Fagan, president of district 5, was made chairman of the resolutions committee; Harry Fishwick, who succeeded Frank Farrington as head of the Illinois district, was appointed chairman of the scale committee. That committee was instructed to report not later than the tenth day of the convention.

The proceedings were considerably enlivened by the United Mine Workers' Band of Monongah, W. Va., which played a number of original compositions, including one entitled "No Backward Step," dedicated to president Lewis.

John L. Lewis
International President, United Mine Workers

A large part of the report of President Lewis was devoted to the fight made upon the Jacksonville agreement by producing interests. After reciting desertions from the union fold in districts 2, 17, 18 and 23, Mr. Lewis again turned his guns on the Bethlehem Mines Corporation, Consolidation Coal Co. and the Pittsburgh Coal Co., charging them anew with ruthless repudiation of their contracts. Government officials and public leaders generally also came in for castigation.

"Every effort," stated Mr. Lewis, "was made by your officers to crystallize public opinion against the unmorality of the policy of repudiation of wage contracts. Governmental influences which were exercised to bring about the negotiation of the Jacksonville agreement failed to operate in any moral way to compel the recalcitrant operators to live up to the agreement which they had executed with apparent good faith. Trade unionists from time immemorial have been lectured by statesmen, employers, economists and moralists upon the virtue of carrying out the obligations of industrial agreements when negotiated. The United Mine Workers in the 37 years of its existence has never repudiated an agreement once entered into, and yet our organization sought in vain for a friendly public opinion to inflict moral chastisement upon great corporations who thus violated the basic and cardinal principle of industrial relations."

Responsibility for disorganized con-

ditions in the bituminous industry was laid on the doorstep of the operators by Mr. Lewis. The industry, he remarked, "is suffering from a multiplicity of badly organized, poorly financed, wretchedly managed and fiercely competitive producing units." Legislation, he added, offered no hope of stabilization. Rejuvenation must come from within the industry itself.

Both Mr. Lewis and Mr. Murray touched upon the anthracite strike and declared the settlement effected a constructive one. According to Mr. Lewis the final agreement was based "substantially" upon the Pinchot peace program. Drives to organize the non-union fields, explained Mr. Murray, had been hampered somewhat the past two years because of contract repudiations in the union districts. Most of the ills of the industry in the past three years, he maintained, were the result of ruthless competition from non-union operators whose policy has been financially disastrous. "Therefore," he continued, "the only practical solution of the nation's coal ills lies in the complete unionization of the industry."

Mr. Murray expressed an optimistic view of the rehabilitation of the union in Kentucky and Tennessee. He also declared that the fight being waged in northern West Virginia against operators who had abrogated the Baltimore agreement would be won. "We have reason to believe that the unionization campaign now under way in West Virginia will bear fruit."

Criticizes Bureau of Mines

The U. S. Bureau of Mines, he said, has failed to live up to its responsibilities in accident-prevention work because too much time has been given to technical and scientific investigations. The Bureau, he continued, also has failed in taking the lead in promoting uniform state mine safety laws. Failure to publish the reports of its investigations of mine disasters was another point stressed in his indictment of the Bureau. He asked that Washington be memorialized to the end that the Bureau's activities be made to conform with his suggestions.

Mr. Kennedy, discussing the anthracite agreement, which he said "was fully protective of the wage and condition standards of the mine workers and preserved the principle of mutual agreement and collective bargaining," denounced radical criticism of that agreement as coming from forces which take their orders from unseen powers in a foreign land. Echoing Mr. Murray, he declared that "there should be no place in our movement for those who preach solidarity and practice disruption."

In his detailed financial report for the six months ended Dec. 1, 1926, the secretary showed a total income of $890,945.46, expenditures of $998,309.01 and cash on hand on Dec. 1 as $610,748.58.

With the large majorities rolled up at the December elections for the present international officers and many of the anti-organization leaders missing from the list of accredited delegates, it is predicted that the present convention will be much more harmonious than some of its recent predecessors. The final report of the tellers, made public Sunday, showed a majority of 112,662 for Mr. Lewis over John Brophy, a majority of 109,587½ for Mr. Murray over William Stevenson and a majority of 75,079½ for Mr. Kennedy over the combined votes of William Brennan and Charles Harris. A total of 233,985 voted for president.

Rubel Heads Merger of $25,000,000 Plants

A $25,000,000 coal and ice corporation to operate in Brooklyn, Queens and Long Island was formed Jan. 19, when announcement was made of the consolidation of the Rubel Coal & Ice Corporation, the Commonwealth Fuel Co., the Putnam Coal & Ice Co. and the Ice Service Co. The new corporation will bear the name of the present Rubel company and will operate thirty-five coal pockets, forty ice manufactories and fifty coal and ice stations. Distribution of the companies at present totals about 1,800,000 tons of coal and 1,600,000 tons of ice annually.

Samuel Rubel, who began his career as a peddler of coal and ice in 1902 and who took his first carload of coal from a siding in 1910, will be president of the corporation. Richard Wolf of the Commonwealth Coal Co. will be vice-president and Henry Sanger of the Putnam Coal & Ice Co., treasurer. The executive committee will consist of Mr. Rubel, Gardner Pattison, president of Pattison & Bowns, Inc.; H. N. Taylor, president of the United States Distributing Corporation, and W. S. Shipley of the York Company, manufacturer of ice plants.

Two Quit Capital Study of Lehigh Coal & Nav.

Two members of the committee appointed by the Lehigh Coal & Navigation Co. some time ago to review the capital structure of the corporation resigned last week. The two members, representing stockholders, are W. L. Haehnlen of Philadelphia and Samuel S. Walker of New York. Mr. Haehnlen was the author of the resolution at the last annual meeting to have a committee appointed to rearrange the capital structure.

In a letter to Thomas S. Gates, Philadelphia, chairman of the committee, Mr. Haehnlen said he felt obliged to decline to sign the report which Mr. Gates prepared. "I cannot agree that your recommendations are for the best interests of the majority of stockholders, and as the report has already been signed or agreed to before it was submitted for my signature, my resignation was inevitable."

It is said stockholders have felt there should be some distribution of assets to stockholders, including the Lehigh Power securities, of which the Lehigh Navigation Co. holds 600,000 shares.

British General Strike Nearly Suicidal, Union Leaders' Inquest Shows

In calling a general strike which lasted a week, last May, the British labor unions almost committed suicide was the frank admission made on Jan. 20 when about twelve hundred members of the Executives of the British Trades Unions met in London to hold an "inquest" on the big walkout. The meeting was featured by a warm debate between representatives of the coal miners, on whose behalf the strike was called, and members of the general council of the Trades Union Congress, who ordered the tie-up and then called it off. Another subject of discussion was whether the general council had subsequently given full support to the coal miners in their strike, which lasted until November.

Relations between the council and the miners' executive, it was shown, came to grief over the Samuel report. This memorandum was deemed sufficiently reasonable by the council to justify calling off the general strike, but the miners' representatives indignantly rejected it. The council contended that the miners disobeyed its orders after turning the conduct of negotiations over to the council. Assailing the miners' rejection of the Samuel report and their insistence on "not an hour on the day, not a penny off the pay," the council felt that the "position was too grave to justify their being tied to a mere slogan."

In rebuttal, the miners alleged that the council failed to keep its promise to prepare for a general strike and that there was a let-down in its resistance to the reduction of the miners' standards and no warning was given to the workers of the intention to do so. The council's acceptance of the Samuel memorandum, they declared, was an ultimatum to the miners, and the document was contemptuously characterized as "bait."

The miners' reply concluded with the statement that the fight was not over and that the miners' organization was intact and was determined to recover lost time.

The miners' case was put before the meeting by Herbert Smith, president of the Miners' Federation, and A. J. ("Emperor") Cook, secretary, J. H. Thomas, M.P., spoke for the general council, followed by Mr. Citrine, secretary of the Trades Union Congress, and Ernest Bevin, who took vigorous exception to the remarks of "Emperor" Cook.

Equalization of rates from mines on the Pittsburgh, Shawmut & Northern with those from mines on the Pittsburgh & Shawmut to points on the Bradford division of the Erie R.R., via Hyde, Pa., will be considered by the Central Freight Association coal, coke and ore committee at a public hearing in the Chamber of Commerce Building, Pittsburgh, Pa., at 10 a.m., Feb. 10. Rates of $1.72 per net ton to stations Tuna to Ridersville, Pa., inclusive, and of $1.46 to stations Mt. Jewett to Johnsonburg, Pa., inclusive, are proposed.

Central Competitive Field Operators, In Meeting at Toledo, Urge Scale To Compete with Non-Union Mines

A "continuously competitive scale" that will enable union mines to go after business on an equal footing with non-union producers will be demanded by operators of the Central Competitive Field when they meet representatives of the United Mine Workers to draw up a new wage agreement next month. This was decided upon at a meeting of producers from Ohio, western Pennsylvania, Illinois and Indiana held in Toledo, Ohio, Jan. 19, for the purpose of organizing a united front for the approaching negotiations with the union.

Ohio and western Pennsylvania operators made the proposal for a sliding scale of miners' pay and they said after the meeting they were gratified to find the Indiana and Illinois operators saw things the way they did.

The miners are in convention in Indianapolis this week to formulate their demands for presentation when the scale committees meet.

At the close of the Toledo meeting announcement was made of the passage of the following resolution:

"It is the sense of the meeting that the scale between the operators of the Central Competitive Field and the miners' organization or miners must be continuously competitive with the wages paid in West Virginia and Kentucky."

The Jacksonville scale, now in effect in the union fields, is $7.50 a day for inside day labor, but the non-union fields which sell in the same markets pay anywhere from $3.50 to $6 a day. The union operators have not announced how stiff a cut they would expect to make. Their plan is to adjust the scales in the Northern fields periodically, possibly every three months, in relation to an average of scales paid in the Fairmont, Kanawha and other non-union fields.

May Be Showdown with Union

The Toledo meeting indicates the possibility of a final "showdown" with the United Mine Workers, perhaps drifting into a bitter open-shop fight, as well as a trade war between the Northern and Southern operators by which the North would try to win back part of the vast business taken in the last twenty years by the coal producers south of the Ohio River.

If the union refuses to accept a lower scale it is likely that some of the operators will try to run their mines open shop. A significant expression in the resolution passed Jan. 19—"The miners' organization or miners"—suggests that if the mines go open shop the sliding scale will be adopted as the method of fixing the pay.

The Jacksonville agreement of 1924 stipulated that the scale meetings be held at Miami, Fla., beginning Feb. 14, but most of the union operators want to change the place to a Northern city. An effort was made at Toledo to bring this about, but the Indiana delegation held out for Miami. A subcommittee was appointed to meet in Toledo this week to decide on the city. If Indiana does not agree to the change the meeting will be held in Miami. The United Mine Workers has announced it was willing to change.

H. C. Perry of Hillsboro, Ill., was chairman of last week's meeting. The Ohio operators' committee was composed of S. H. Robbins of the Youghiogheny & Ohio Coal Co., F. E. Taplin of the North American Coal Corporation, William Collins of the M. A. Hanna Co., A. A. Augustus of the Cambridge Collieries Co., all of Cleveland; R. L. Wildermuth of the Lorain Coal & Dock Co., Columbus; John S. Jones of the Sunday Creek Coal Co., Columbus; George M. Jones of the Ohio Collieries Co., Toledo.

Pennsylvania was represented by Whitney Warner of W. H. Warner & Co., Cleveland, and Horace E. Baker, recently elected president of the Pittsburgh Terminal Coal Corporation, Pittsburgh.

The Illinois scale committee consisted of L. H. Smith, Spring Valley; M. F. Peltier, Peabody Coal Co., Chicago; M. S. Coleman, Harrisburg; Rice Miller and H. C. Perry, Hillsboro; George B. Harrington, Chicago, and J. D. Zook, O'Gara Coal Co.

Indiana delegates were P. H. Penna, J. A. Templeton, M. L. Gould, E. D. Logsdon, Hugh Shirkie, J. B. Pauley, David Ogle and W. J. Freeman.

Says Pittsburgh Is Undecided

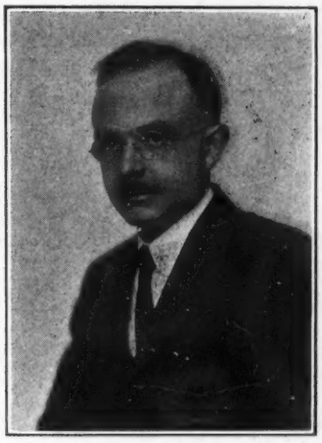
The position to be taken by Pittsburgh district bituminous operators in the wage negotiations with the United Mine Workers has not yet been determined, H. F. Baker, president of the Pittsburgh Terminal Coal Corporation, said in Pittsburgh late last week. Mr. Baker had just returned from the meeting of operators of the Central Competitive Field at Toledo.

While the position of the operators in the other three states relative to their proposals to be made in the joint negotiations had been determined, said Mr. Baker, the stand of the Pittsburgh district operators would not be determined until after a meeting in Pittsburgh this week.

Speaking for the Pittsburgh Terminal Coal Corporation, which at present employs about 3,000 miners and is the largest union company in the district, Mr. Baker said he expected the "friendly relations with the union would be continued after the expiration of the Jacksonville agreement."

McCulloch for Trade Board

Edgar A. McCulloch, a Democrat and a Justice of the State Supreme Court of Arkansas, was nominated Jan. 15 as a member of the Federal Trade Commission, to succeed to the vacancy caused by the expiration of the term of Huston Thompson.



C. E. Lesher

Lesher Named to New Post

C. E. Lesher has been elected executive vice-president of the Pittsburgh Coal Co., a position newly created by the board of directors. Among the specific assignments Mr. Lesher will have charge of are planning, statistics and research, the development of which is under way, purchases and real estate. For the last three years he has been assistant to the president.

Virginian Urges New Branch To Aid Coal Traffic

The Virginian R.R. through the Virginian & Western Co., a subsidiary, petitioned the Interstate Commerce Commission, Jan. 22, for permission to construct a 40-mile extension of its Guyandot River branch in West Virginia to run from Itmann and Gilbert.

The Guyandot River branch would constitute a complete connection between the Virginian, the Chesapeake & Ohio and the Norfolk & Western lines within West Virginia coal field. This would allow a three-way movement of coal—to the East West and North—without backhauling.

The connection has been deemed important also by the Chesapeake & Ohio, which has pending an application for permission to construct two lines through the same territory. The Virginian, however, holds that its right to undertake the construction is superior to that of the Chesapeake & Ohio by reason of earlier occupancy.

Orders Prejudice Removed

In a report to the Interstate Commerce Commission William H. Smith, one of its examiners, holds that the failure of the Chesapeake & Ohio Ry. to absorb the team-track charges of the Pennsylvania R.R. at Norwood and East Norwood within the switching limits of Cincinnati, when such tracks are used for unloading coal shipped from the mines of the Kentucky Coal Co. in Kentucky, Tennessee and West Virginia, at a time when the carrier is absorbing like charges at other stations, should be found unduly prejudicial and the prejudice be removed.

Pittsburgh Coal Co. Reduces Mine Wages; Reports More at Work

The Pittsburgh Coal Co. on Jan. 18 notified the employees at its mines in the Pittsburgh district of a reduction in wages to become effective Jan. 21. The notice posted at the mines stated "We regret that owing to the fall in the market price of coal it is necessary for us to reduce wages, effective Jan. 21, 1927. On Oct. 26, 1926, due to higher prices for coal, it was possible for the company to increase wages and the announcement was made at that time that when prices dropped wages would be adjusted accordingly."

The new scale is a reduction of 20 per cent on tonnage rates and cuts the basic wage for day workers to $6. The scale is, for different workers, from 15 to 20 per cent over the November, 1917, scale in effect at these mines prior to last November.

On Wednesday, the day following the posting of the notice, the company reported there were 5,704 men at work, or 100 more than at any time since the company went on the open-shop plan.

The new rates of pay are as follows:

	Thick, Cents	Thin, Cents
Loading after machines, per ton	62	65
Undercutting with machines, per ton	12	14.4
Pick mining, per ton	88	94

Yardage and deadwork rates will be decreased accordingly.

DAY LABOR RATES INSIDE THE MINE

	Per Day
Drivers	$6.00
Motormen	6.10
Snappers	6.00
Track layers	6.00
Track layers' helpers	5.75
Timber men	6.00
Timber men helpers	5.75
Wiremen	6.00
Wiremen helpers	5.75
Trappers	3.50
Other inside day labor	5.75

OUTSIDE DAY LABOR

Dumpers	5.40
Pushers	4.65
Car trimmers	5.15
Railroad car cleaners	5.00

Other outside day labor rates will be changed proportionately.

The price of house coal will be $1.95.

W. J. Rainey, Inc., was the first of the large independents in the Connellsville district to post notice of a decrease in wages. This company went on a $6 per day basic wage on Friday, the same day the Pittsburgh Coal Co. reduction became effective. On Jan. 24 the Hillman Coal & Coke Co., Washington Coal & Coke Co., Pioneer Coal & Coke Co. and others adopted the same wage scale.

The Lincoln Gas Coal Co. and the Fort Pitt Coal & Coke Co. also followed the Pittsburgh Coal Co. in establishing a lower wage rate in the Pittsburgh field. They will operate on the basic $6 per day rate, the same as the larger company.

In central Pennsylvania there was a strike when a reduction was announced at Twin Rocks. The Big Bend Coal Mining Co. has not yet resumed operations. The November, 1917, scale is in effect at the Commercial Coal Mining Co. and at Colver. The Hughes Coal Co. has signed the Jacksonville agreement and is working, but all the other operations on the Black Lick branch from Twin Rocks to Josephine, except at Nanty Glo, are on the lower wage basis. In the Nanty Glo region the Nanty Glo, Cardiff and Revloc operations are working under the Jacksonville pact.

R. H. Buchanan

Newly inaugurated president of the Engineers' Society of Northeastern Pennsylvania

The companies in and around Madera, including the Liberty Coal Mining Co. and McGlynn plants, went back to the 1917 wage last week. The same rates are in effect in the region around Boardman, Kellytown and Smoke Run. Madeira, Hill & Co., Berwind-White and Mountz & Co. are paying the union scale. At Osceola Mills the bigger operations also are paying the union wage, but several are anxious to make a cut. The larger plants around Philipsburg and Morrisdale are still under the Jacksonville agreement, while the smaller ones are on the 1917 basis.

The lower rates prevail at all of the mines at Johnstown, and the same is true of virtually all of the plants on the Baltimore & Ohio and Western Maryland railroads in Somerset County, except the Consolidation Coal Co., which pays the high scale. Operations on the Pennsylvania R.R. in Somerset County, including Berwind-White, are paying the union rates. On the "main line" west from Johnstown to Derry the larger companies are paying the Jacksonville rates and the smaller ones have gone back to the 1917 basis. The same is true of all companies on the Indiana branch, P.R.R., from Blairsville to Homer City. Reductions likewise have been made at operations on the Shawmut R.R. Mines on the Buffalo, Rochester & Pittsburgh Ry., however, are paying the union rates.

John I. Rogers, 70 years old, veteran coal operator, died at Connellsville, Pa., on Jan. 20 of a heart ailment. He was the founder of the Rogers Coal Co., which was said to have shipped the first car of coal from the Indian Creek Valley, when development of that field was begun many years ago.

Engineers of Anthracite Region Plan for a Quota Of One Thousand Members

Meeting in Scranton, the Engineers' Society of Northeastern Pennsylvania on Jan. 20 inaugurated R. H. Buchanan, president of the South Penn Collieries Co., as president of the society for the coming year and started a drive to increase the membership to one thousand. The dinner marked the thirtieth anniversary of the founding of the society.

S. D. Dimmick, general manager, Glen Alden Coal Co., acted as toastmaster, saying that the engineers by their lack of organization had failed to convince the public of the importance of engineering in promoting national prosperity and the success of industrial undertakings. C. R. Seem, the outgoing president, electrical engineer of the Glen Alden Coal Co., declared that the average engineer was entirely incapable in most cases of selling his services and his ideas to the company officials. R. H. Buchanan, the new president, called for memberships to support the society, which should be as wide as the anthracite region and have not less than a thousand members.

W. L. Abbott, retiring president, American Society of Mechanical Engineers, and chief operating engineer, Commonwealth Edison Co., of Chicago, discussed the exhaustion of coal. The earth contains seven trillions of tons of coal and at the present rate of consumption will last 6,000 years, but normally the production of coal increased 4 per cent per annum, so in the year 2125 we may find all our coal has gone.

Petroleum and economy have prevented the 4-per cent rate from being operative, but petroleum resources will soon be exhausted, and the economy which has enabled us to get twice as much power per ton of coal as we did twenty years ago must reach a limit eventually. It should also be remembered that only one-third of the countries of the world have so far awakened to the value of power.

Mr. Abbott went on to say that the consumption of coal was wrapping the world in a coat of carbon dioxide that would reduce temperature variations. Moisture had the same effect, but the action of carbon dioxide was increasing with the rise in its percentage. We are putting back into the air the carbon dioxide that was removed by vegetation in earlier ages. This inert gas it was that kept the earth equably warm in the coal-forming ages.

Judge Harold B. Wells, Bordentown, N. J., concluded with a witty, inspirational speech on the "Philosophy of Life."

The Koppers Company has filed a complaint with the Interstate Commerce Commission against the application of rates in excess of Group 3 rates from its mines in the Kanawha district of West Virginia on shipments of coal from points on the Pond Fork & Bald Knob R.R. to destinations in Virginia, Illinois and New Jersey as unlawful, unjustly discriminatory and unduly prejudicial on shipments moving prior to May 10, 1926.

Coal Industry Faces Unjust Criticism In Farm-Relief Debate; Vote Trading Hinted; Bigger Menace Faces Business

By Paul Wooton
Washington Correspondent of *Coal Age*

In the debate on the McNary-Haugen farm-relief bill the coal industry bids fair to come in for undeserved criticism. Opponents of the McNary-Haugen bill have announced their intention of airing on the floor of the House the rumor that votes for the measure were obtained in a trade involving the Parker coal bill.

It is thought that the supporters of the McNary-Haugen bill used their influence to bring pressure on members of the Interstate and Foreign Commerce Committee of the House of Representatives to vote against the Parker bill, on the understanding that certain votes from coal-producing districts would be cast for the first-named measure. This accounts, it is said, for the surprisingly large vote against the Parker bill.

That politics makes strange bedfellows is proved frequently in Washington. These legislative trades, however, originate in Congress. It is not an uncommon thing to hear of arrangements whereby votes have been obtained for one proposition on the promise to support in turn another proposition. It is fully expected, however, that any trading that may have been done in connection with the coal bill will be blamed unqualifiedly on the coal industry.

Coal Industry's Hands Clean

If there was any trading of the character mentioned it is obvious that it was not suggested by the coal industry. Leaders among the producers are too thoroughly familiar with questions of public relations to have approved any such playing with fire. Of all industries it would be the last to aid and abet in an effort to set up the government in the business of buying and selling agricultural commodities on a scale never thought of in any country in the world. The coal operators, wholesalers and retailers were almost unanimous in their opposition to the Parker bill, but it was more because of the precedent that would have established rather than the provisions of the bill itself. Most of the statistics which the bill called for already are being obtained, in some form, by the government.

While the President has no law to guide him in the handling of an emergency in coal, he is in a position to take steps without specific authority which would be more objectionable to the coal industry than that conferred by the Parker bill. For this reason it was more the fear of what the next step might be than the immediate provisions of the Parker bill which unified the coal industry against that legislation. Of the two evils it is safe to say that the coal industry would have preferred the Parker bill with a few statistics and a few emergency powers to the McNary-Haugen plan, which puts the government in business in such a large way that public ownership of coal mines would seem small in comparison.

Throughout the extended consideration of the McNary-Haugen bill it has been argued that to undertake that form of farm relief would be only the beginning of government excursions into business activities.

More Meddling Feared

The McNary-Haugen bill has more strength behind it this session than was the case at the preceding session. It is predicted that it will pass the House. It may not get through the Senate in the few remaining weeks of this Congress, but it will show strength enough to force some direct concession to agricultural interests. The fear is that the government is likely to be drawn more deeply into the more direct assumption of the responsibilities of private business. Any aid or comfort given this legislation, many believe, is helping to a much more dangerous precedent for more government in business than the collection of statistics or the exercise of emergency powers.

EDITOR'S NOTE—*The foregoing Washington letter reflects certain views of official Washington. Due to the fact that policy as a rule prevents government officials from permitting their views being quoted directly, the authority for these reports is necessarily somewhat vaguely referred to. The views reflected are not those of any one group of officials, but of different men, in the legislative and executive departments. There is no necessary connection between their views and* COAL AGE *editorial policy; neither do they necessarily represent Mr. Wooton's personal views. It is felt that the opinions thus faithfully reflected will be of great interest to the industry. Where opinions are cited from sources outside of the government, the source will be specifically stated.*

Woods Nomination Rejected By Overwhelming Vote

The nomination of Cyrus E. Woods of Pennsylvania for the Interstate Commerce Commission was rejected by the Senate on Jan. 24 by the decisive vote of 49 to 28. The refusal to appoint Mr. Woods came as a distinct surprise, for the attack against him was not based on his personal record but was rather directed against Pennsylvania and that state's interest in the lake cargo case.

Those who led the fight against Mr. Woods charged that an effort was being made to "pack" the Interstate Commerce Commission, but Senator Reed of Pennsylvania, who made a strenuous effort to overcome the objections, stated that Mr. Woods would not even sit on the Commission in the cargo case. The opposition, led chiefly by Senators from Virginia, West Virginia, Kentucky and Tennessee, declared that Pennsylvania was endeavoring to obtain a monopoly on the bituminous coal industry of the United States.

To Vote on Stock Splitup In Island Creek

Stockholders of the Island Creek Coal Co., operating mines in southern West Virginia, will hold a special meeting on Jan. 31 at Portland, Me., to vote on the proposal of the board of directors to increase the authorized common stock from 150,000 shares to 650,000 shares. The recommended increase in the number of common shares is believed to foreshadow a stock splitup, the basis of which will be determined later. The management thus far has not given any indication of its plans. The total number of shares outstanding at present is 118,802 shares.

The stock has been active recently in response to rumors of a change in the capital structure. Some sales of late have been made at 238.

Fisher Would Reorganize Keystone Mine Bureau; Walsh Still in Charge

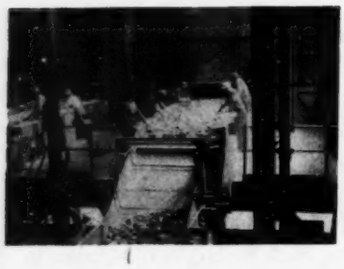
Reorganization of the State Department of Mines of Pennsylvania was suggested by John S. Fisher, who succeeded Governor Pinchot on Jan. 18. In his inaugural address the new executive said there should be two bureaus with separate jurisdiction over anthracite and bituminous coal mining. The new Governor also recommended the broadening of the scope of the department to deal with all matters relating to mining, marketing and transportation of coal products.

Governor Fisher also recommended a readjustment of the state workmen's compensation act.

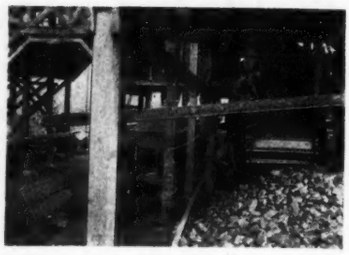
In his message he said, regarding the Department of Mines:

"The departments designed to protect workers in industry are reasonably adequate with the exception of the Department of Mines. Since the mining codes were enacted the coal industry has undergone great changes and the distinctions between the anthracite and the bituminous fields have become more and more marked. I believe this department should be expanded into two distinct bureaus with separate jurisdictions over each field. I also recommend that the scope of the department be broadened to deal with all matters relating to the mining, marketing and transportation of coal products. This industry is so vital to the prosperity of the state that it should be fostered in every way. At the same time the 250,000 miners who hazard their lives in a calling attended with unusual dangers should be protected with scrupulous care."

Joseph J. Walsh, the Pinchot Secretary of Mines, has not been displaced so far, and it is probable that there will be no announcement of any change in the department until a reorganization measure has been passed by the Legislature and approved by the Governor.



Production And the Market



Coal Market Developments Share Interest With Union Wage Convention

Market changes—such as they were—in the bituminous coal trade of the United States during the last week continued to be dependent to a large extent upon the actions of the weather, with purchases for reserve stocks by large industrial consumers playing an unobtrusive and, perhaps for that reason, a not fully appreciated role. While it is true that a goodly portion of this buying was of "no-bill" coal by the railroads, its importance as a safety valve on the general situation was far-reaching. Low temperatures over a large portion of the country have served to maintain a steadying influence on the demand for sizes suitable for household consumption.

Announcement of the intention of the Central Competitive Field producers to demand "a continuously competitive scale" will focus attention more fixedly on Indianapolis, where the United Mine Workers' wage convention is now in session. And developments there are certain to have an important bearing on industrial demand, especially for storage purposes, for a large number of speculatively inclined consumers have been waiting "to see what would happen." Therefore there is little doubt that this class of business will show increasing vigor as the closing date of the old agreement approaches.

Coal Age Index of spot bituminous prices on Jan. 24 was 188 and the corresponding weighted average price was $2.28. Compared with the figures for Jan. 17 this was a further recession of 4 points and 4c. Declines in spot quotations on high-volatile coals of southern West Virginia as well as on those of the Pittsburgh district and the Ohio No. 8 field were largely responsible for the declension. Though there was an undercurrent of weakness in the Midwest market there were no real breaks in prices. The situation in New England and at New York and Philadelphia remains reasonably steady. At Baltimore the trade is featureless, even the export business having collapsed. A surprising development in the Kansas City market was the report that orders for domestic sizes were in excess of supply.

Output Still Climbing

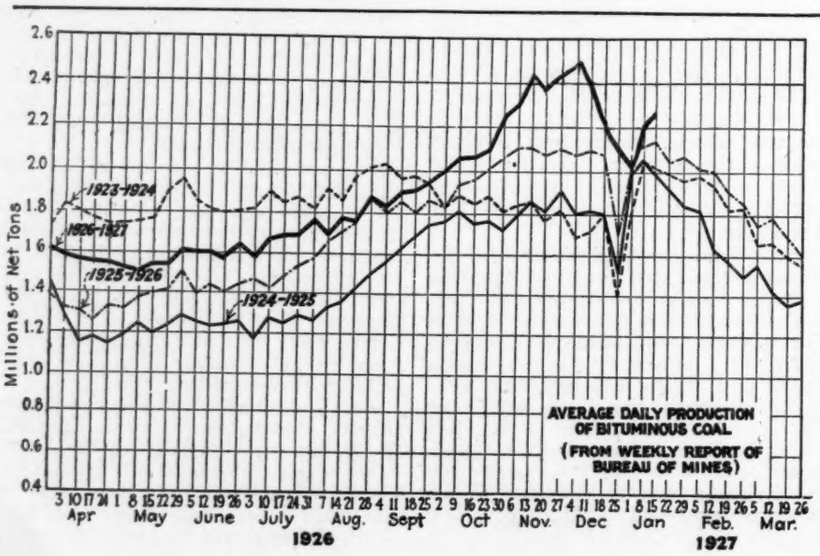
Bituminous production registered a further ascent from the holiday dip. For the week ended Jan. 15 the total output, according to the estimate of the U. S. Bureau of Mines, was 13,550,000 net tons, an increase of 297,000 tons over the figure for the preceding week. Though this compares favorably with the all-time record previous to the smashing totals of last November and early December, the preliminary loading figures for Jan. 17 and 18 were in excess of those for the corresponding days of the week before.

An interesting development in the labor situation during the past week was the sudden announcement of a reduction in wages by the Pittsburgh Coal Co., which was expected to continue in effect the Nov. 1 advances until April 1. A number of independents in the Connellsville coke region quickly followed the move of the Pittsburgh Coal Co. by making proportionate reductions, bringing the basic day rate to $6.

Anthracite Gains Strength

Increasing strength pervaded the market for domestic anthracite last week, though the distribution of interest was far from even. New York enjoyed the major portion of the renewal of activity, with pea and egg in the van, stove and nut being relatively quiet. Coal is plentiful at the piers, however. No. 1 buckwheat continues to stiffen, some independent tonnage moving at $5 in the New York market and $1.50 less at Philadelphia. Nevertheless practically all the mines have seen fit to curtail production.

The Connellsville spot coke market developed unmistakable softness on the heels of the reduction in wages by some of the large independent operators, without as yet arriving at a definite level. Spot furnace coke is now offered at approximately $3.25. For spot foundry coke the market is dull, with quotations nominal at $4.50@$5. Adjustments on contracts in keeping with the wage cut will be made by the interests affected.



Estimates of Production

(Net Tons)

BITUMINOUS

	1926	1927
Jan. 1	10,704,000	10,711,000
Jan. 8 (a)	13,031,000	13,253,000
Jan. 15 (b)	13,068,000	13,550,000
Daily average	2,178,000	2,258,000
Coal year to date (c)	419,535,000	459,355,000
Daily average	1,724,000	1,885,000

ANTHRACITE

Jan. 1	28,000	1,128,000
Jan. 8	47,000	1,368,000
Jan. 15 (b)	37,000	1,834,000
Coal year to date (c)	40,492,000	77,178,000

BEEHIVE COKE

Jan. 1	299,000	172,000
Jan. 8	289,000	170,000
Jan. 15	311,000	179,000
Cal. yr. to date	649,000	378,000

(a) Revised since last report. (b) Subject to revision. (c) Adjusted to equalize number of days n the two years.

Fair Week in Middle West

Business in the Middle West was on a fairly satisfactory basis last week. Retail stocking in anticipation of another cold wave was the chief stimulating factor. While there were no real breaks in prices, there was a slight undercurrent of weakness. Franklin County led the list of Illinois-Indiana coals, with the larger operators asking $4 for 6-in. lump. Prices in other districts tapered down to as low as $2.25.

Steam coal demand is unexciting. Prices show little change. Railroads in Chicago territory are reported to have 45 to 125 days' storage supply on hand. It is assumed that roads with less than 100 days' reserve will build their stockpiles up to that figure. Despite this movement, industrial consumers display no particular anxiety over the outlook, which is further clouded by rumors of strike votes on railroads serving the non-union fields.

In the southern Illinois mining fields, the smaller domestic and the larger steam sizes are inclined to drag heavily. Railroads, however, are helping the general situation by buying "no-bill" coal for storage. As a result, running time ranges from four up to six days at some of the operations. The greatest weakness in the price list is in offerings from the strip pits, which are staging a hot battle against western Kentucky.

Duquoin-Jackson Field Active

Steam coals are the only ones which are not moving freely out of the Duquoin and Jackson County fields. Most of the mines in that section are reported to be working full time. Heavy railroad buying and an active industrial movement to the Missouri River cities, Minneapolis and St. Louis, is boosting running time in the Mt. Olive district. Improvement, particularly in domestic lump and egg and in screenings, is reported in the Standard district. Screenings are selling up to $1.25, but 2-in. lump is down to $2.15.

In the St. Louis local market cold weather has eaten into the retail yard stocks and stimulated buying demand for the lower priced offerings from Illinois and western Kentucky. Country domestic trade also is active. St. Louis wagon demand for steam coal is unusually brisk and carload orders for Standard screenings at times exceed the free tonnage. St. Louis sales agencies are gratified over the demand for the smaller steam nuts from Omaha, Minneapolis and Chicago.

The weather man also proved a good friend of the Kentucky operators. Zero registers enlivened the demand for both steam and domestic grades in the Louisville market, advancing prices on western Kentucky slack and cutting the number of "no bills" in both sections of the state. Mines, however, are not working anywhere near to capacity, although output is holding up well for this time of the year.

Current Quotations—Spot Prices, Bituminous Coal—Net Tons, F.O.B. Mines

Low-Volatile, Eastern	Market Quoted	Jan. 25 1926	Jan. 10 1927	Jan. 17 1927	Jan. 24 1927†
Smokeless lump	Columbus	$4.35	$3.85	$3.60	$3.50@$3.75
Smokeless mine run	Columbus	2.60	2.50	2.35	2.25@ 2.50
Smokeless screenings	Columbus	1.85	1.85	1.75	**1.70@ 2.00**
Smokeless lump	Chicago	4.00	3.60	3.60	*3.25@ 3.75*
Smokeless mine run	Chicago	2.10	2.50	2.75	*2.25@ 3.00*
Smokeless lump	Cincinnati	4.25	3.75	3.60	**3.75**
Smokeless mine run	Cincinnati	2.25	3.00	3.00	*2.25@ 3.00*
Smokeless screenings	Cincinnati	1.35	2.35	2.35	*2.00@ 2.50*
*Smokeless mine run	Boston	4.85	5.25	5.30	5.25@ 5.40
Clearfield mine run	Boston	2.05	2.45	2.40	**2.25@ 2.65**
Cambria mine run	Boston	2.35	2.80	2.75	2.50@ 3.00
Somerset mine run	Boston	2.15	2.55	2.55	2.35@ 2.80
Pool 1 (Navy Standard)	New York	3.05	3.25	3.25	3.00@ 3.50
Pool 1 (Navy Standard)	Philadelphia	2.95	3.15	3.10	3.00@ 3.25
Pool 1 (Navy Standard)	Baltimore	2.30	2.60	2.60	2.50@ 2.75
Pool 9 (Super. Low Vol.)	New York	2.55	2.60	2.55	2.45@ 2.65
Pool 9 (Super. Low Vol.)	Philadelphia	2.60	2.70	2.55	2.45@ 2.65
Pool 9 (Super. Low Vol.)	Baltimore	2.15	2.15	2.15	2.05@ 2.25
Pool 10 (H.Gr.Low Vol.)	New York	2.25	2.30	2.30	2.15@ 2.50
Pool 10 (H.Gr.Low Vol.)	Philadelphia	2.35	2.40	2.35	2.25@ 2.45
Pool 10 (H.Gr.Low Vol.)	Baltimore	1.95	1.90	1.90	1.85@ 2.00
Pool 11 (Low Vol.)	New York	2.10	2.05	2.00	1.85@ 2.20
Pool 11 (Low Vol.)	Philadelphia	2.10	2.20	2.10	2.00@ 2.20
Pool 11 (Low Vol.)	Baltimore	1.70	1.75	1.75	1.75@ 1.80
High-Volatile, Eastern					
Pool 54-64 (Gas and St.)	New York	1.60	1.60	1.60	1.50@ 1.75
Pool 54-64 (Gas and St.)	Philadelphia	1.60	1.60	1.60	1.50@ 1.70
Pool 54-64 (Gas and St.)	Baltimore	1.65	1.55	1.55	1.50@ 1.60
Pittsburgh sc'd gas	Pittsburgh	2.65	2.60	2.60	*2.50@ 2.60*
Pittsburgh gas mine run	Pittsburgh	2.10	2.20	2.20	*2.00@ 2.25*
Pittsburgh mine run (St.)	Pittsburgh	2.05	2.10	2.10	*1.90@ 2.00*
Pittsburgh slack (Gas)	Pittsburgh	1.45	1.65	1.65	*1.50@ 1.60*
Kanawha lump	Columbus	2.25	2.50	2.45	2.25@ 2.65
Kanawha mine run	Columbus	1.70	1.85	1.85	1.75@ 2.00
Kanawha screenings	Columbus	.85	1.35	1.25	*1.15@ 1.30*
W. Va. lump	Cincinnati	2.60	2.60	2.75	2.50@ 3.00
W. Va. gas mine run	Cincinnati	1.45	1.85	1.60	1.50@ 1.75
W. Va. steam mine run	Cincinnati	1.30	1.65	1.40	1.25@ 1.60
W. Va. screenings	Cincinnati	.75	1.35	1.30	*1.10@ 1.35*
Hocking lump	Columbus	2.35	2.55	2.50	**2.25@ 2.80**
Hocking mine run	Columbus	1.75	1.85	1.85	1.75@ 2.00
Hocking screenings	Columbus	1.20	1.40	1.30	**1.30@ 1.45**
Pitts. No. 8 lump	Cleveland	2.30	2.35	2.35	2.00@ 2.75
Pitts. No. 8 mine run	Cleveland	1.80	1.90	1.90	*1.85@ 1.90*
Pitts. No. 8 screenings	Cleveland	1.30	1.65	1.55	*1.35@ 1.40*

Midwest	Market Quoted	Jan. 25 1926	Jan. 10 1927	Jan. 17 1927	Jan. 24 1927†
Franklin, Ill. lump	Chicago	$3.50	$4.00	$4.00	$4.00
Franklin, Ill. mine run	Chicago	2.50	2.60	2.60	2.50@ 2.75
Franklin, Ill. screenings	Chicago	1.85	1.85	1.85	1.75@ 2.00
Central, Ill. lump	Chicago	3.10	2.75	2.75	*2.25@ 2.50*
Central, Ill. mine run	Chicago	2.30	2.10	2.10	2.00@ 2.25
Central, Ill. screenings	Chicago	1.40	1.40	1.40	1.35@ 1.50
Ind. 4th Vein lump	Chicago	3.00	3.25	3.35	3.25@ 3.50
Ind. 4th Vein mine run	Chicago	2.30	2.35	2.35	2.25@ 2.50
Ind. 4th Vein screenings	Chicago	1.85	2.00	2.00	2.00
Ind. 5th Vein lump	Chicago	2.40	2.50	2.50	2.40@ 2.65
Ind. 5th Vein mine run	Chicago	1.95	2.10	2.10	2.00@ 2.25
Ind. 5th Vein screenings	Chicago	1.25	1.50	1.50	1.40@ 1.60
Mt. Olive lump	St. Louis	2.85	2.85	2.85	2.75@ 3.00
Mt. Olive mine run	St. Louis	2.00	2.50	2.50	2.50
Mt. Olive screenings	St. Louis	1.75	1.50	1.50	1.50
Standard lump	St. Louis	2.45	2.35	2.35	2.25@ 2.50
Standard mine run	St. Louis	1.80	1.80	1.80	1.75@ 1.90
Standard screenings	St. Louis	1.05	1.20	1.20	1.15@ 1.25
West Ky. block	Louisville	2.05	2.60	2.60	2.50@ 2.75
West Ky. mine run	Louisville	1.35	1.55	1.40	1.25@ 1.60
West Ky. screenings	Louisville	.90	1.25	1.15	**1.20@ 1.50**
West Ky. block	Chicago	2.10	2.10	2.35	2.25@ 2.50
West Ky. mine run	Chicago	1.50	1.85	1.85	1.75@ 2.00
South and Southwest					
Big Seam lump	Birmingham	2.75	2.60	2.60	2.50@ 2.75
Big Seam mine run	Birmingham	2.10	1.85	2.00	*1.50@ 2.00*
Big Seam (washed)	Birmingham	2.30	2.00	1.75	**1.75@ 2.25**
S. E. Ky. block	Chicago	2.85	2.85	2.60	2.25@ 3.00
S. E. Ky. mine run	Chicago	1.85	1.95	1.80	1.60@ 2.00
S. E. Ky. block	Louisville	2.85	2.60	2.60	2.50@ 2.75
S. E. Ky. mine run	Louisville	1.55	1.85	1.85	1.75@ 2.00
S. E. Ky. screenings	Louisville	1.00	1.55	1.35	1.25@ 1.50
S. E. Ky. block	Cincinnati	3.00	2.75	2.60	**2.50@ 3.00**
S. E. Ky. mine run	Cincinnati	1.40	1.80	1.55	**1.50@ 1.85**
S. E. Ky. screenings	Cincinnati	.80	1.30	1.25	*1.10@ 1.40*
Kansas lump	Kansas City	5.00	4.60	4.60	4.50@ 4.75
Kansas mine run	Kansas City	3.10	3.00	3.00	3.00
Kansas screenings	Kansas City	2.30	2.35	2.35	2.35

* Gross tons, f.o.b. vessel, Hampton Roads.
† Advances over previous week shown in **heavy type**; declines in *italics*.

Current Quotations—Spot Prices, Anthracite—Gross Tons, F.O.B. Mines

	Market Quoted	Freight Rates	Jan. 25, 1926 Independent	Jan. 25, 1926 Company	Jan. 17, 1927 Independent	Jan. 17, 1927 Company	Jan. 24, 1927† Independent	Jan. 24, 1927† Company
Broken	New York	$2.34	.....	.....	.....	$8.50@$9.25	.....	$8.50@$9.25
Broken	Philadelphia	2.39	.....	.....	$9.25	8.50@ 9.15	$9.25	8.50@ 9.15
Egg	New York	2.34	.....	.....	8.50@ 9.00	8.75@ 9.25	**8.75@ 9.00**	8.75@ 9.25
Egg	Philadelphia	2.39	.....	.....	8.40@ 9.50	9.00@ 9.15	8.40@ 9.50	9.00@ 9.15
Egg	Chicago*	5.06	$9.50@10.00	$8.03@$8.25	8.26	8.13	8.26	8.13
Stove	New York	2.34	.....	.....	9.00@ 9.50	9.25@ 9.50	9.00@ 9.50	9.25@ 9.50
Stove	Philadelphia	2.39	.....	.....	9.35@ 9.75	9.25@ 9.50	9.35@ 9.75	9.25@ 9.50
Stove	Chicago*	5.06	10.00@11.00	8.40@ 8.80	8.71	8.58	8.71	8.58
Chestnut	New York	2.34	.....	.....	8.75@ 9.25	8.75@ 9.15	8.75@ 9.25	8.75@ 9.15
Chestnut	Philadelphia	2.39	.....	.....	8.75@ 9.40	9.00@ 9.15	8.75@ 9.40	9.00@ 9.15
Chestnut	Chicago*	5.06	10.00@11.00	8.50@ 8.75	8.48	8.53	8.48	8.53
Pea	New York	2.22	.....	.....	6.00@ 6.50	6.00@ 6.50	**6.50@ 7.25**	6.00@ 6.50
Pea	Philadelphia	2.14	.....	.....	6.00@ 6.75	6.50	6.00@ 6.75	6.50
Pea	Chicago*	4.79	5.50@ 6.00	5.50@ 6.00	6.03	6.10	6.03	6.10
Buckwheat No. 1	New York	2.22	.....	.....	3.75@ 4.25	2.50@ 3.50	**4.25@ 5.00**	2.50@ 3.50
Buckwheat No. 1	Philadelphia	2.14	.....	.....	2.75@ 3.25	2.50@ 3.00	2.75@ 3.25	2.50@ 3.00
Rice	New York	2.22	.....	.....	1.90@ 2.30	2.00@ 2.25	**2.10@ 2.40**	2.00@ 2.25
Rice	Philadelphia	2.14	.....	.....	1.90@ 2.00	1.75@ 2.25	1.90@ 2.00	1.75@ 2.25
Barley	New York	2.22	.....	.....	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75	1.50@ 1.75
Barley	Philadelphia	2.14	.....	.....	1.25@ 1.50	1.50@ 1.75	1.25@ 1.50	1.50@ 1.75
Birdeye	New York	2.22	.....	.....	1.35@ 1.65	2.00	.....	2.00

* Net tons, f.o.b. mines. † Advances over previous week shown in **heavy type**; declines in *italics*.

Price Situation Favorable

With prices ranging from $1.25 for screenings up to $2.75 for block in both eastern and western Kentucky, this phase of the market is considered in good shape. The strengthening in the quotations on fine coal is held in some quarters to be the forerunner of further advances. Operators are hoping that there will be a broadening of the domestic market.

Optimism over current developments is still strong in the Northwest. Shipments from the docks at the head of the Lakes during January probably will run several thousand cars ahead of last year's total of 23,980 cars for the same month, although it is doubtful if they will equal last month's 33,687 cars.

Competition for business, however, is keen as the operators are anxious to have stocks well cleaned up before the opening of navigation this year. Commercial stocks on Jan. 1 were estimated at 3,400,000 tons of bituminous and 494,000 tons of anthracite. Screenings are tight and some docks may be forced into the open market to take care of their commitments. Smokeless also is scarce. There has been an increase in anthracite shipments from the docks.

With winter weather prevailing in the Twin Cities, there is nevertheless a little easing off in buying. Dealers stocked freely during November and December, and now they are inclined to hold down somewhat on their orders. Yet consumer demand is decidedly active. Indications are that the season will see consumption better than the average for a number of years past. Steam-trade buying is only fair. Prices are holding steady at former figures for all-rail coal. Dock prices also are unchanged.

Kansas Rid of "No Bills"

For the first time this season, Kansas City reports that orders for domestic sizes of Kansas coal have been in excess of the supply. Cold weather so reduced yard stocks that retailers are pressing for immediate shipment. "No bills" no longer trouble Knsas operators, but Arkansas and Oklahoma producers still have some unbilled loads. If winter temperatures continue these, too, will be cleaned up.

Weather also helped demand for Colorado coals and running time has increased to about 70 per cent. Mine prices are unchanged. Wyoming slack, at $1.65@$1.85, is in good demand. Kemmerer-Rock Springs lump is $4.25; nut, $3.75. The situation is more uneven in Utah. Slack still is heavy and prices range from $1.50 down to $1.25, with the bulk of the tonnage moving at the lower figure.

Domestic sizes held the center of the stage in the Cincinnati market last week. Shippers found no difficulty in maintaining price levels and in some cases advances were registered. Smokeless lump and egg were favorites over a wide territory, with Chicago dealers among the most eager for coal. The better grades of 4- and 6-in. West Virginia high volatile readily brought $3 and the same maximum applied on Harlan and Hazard coals.

On the steam side of the market, however, buyers found things more to their liking. As low as $1.10 was paid for slack, with the minimum on the Logan, Williamson and Kanawha fields $1.25 for steam coals. Gas and byproduct slack held around $1.75. Southeastern Kentucky was $1.50@$1.75, with some sales of byproduct coal at $1.85.

Lake Contracting Slow

One of the interesting features of the market at the present time is the absence of dickering on lake contracts. With the Jacksonville agreement expiring in a few weeks, non-union operators are not interested in tying up tonnage with the lakes at current prices. Moreover, many of the producers are still smarting under the $1.50@$1.65 mine-run basis contracts of last year.

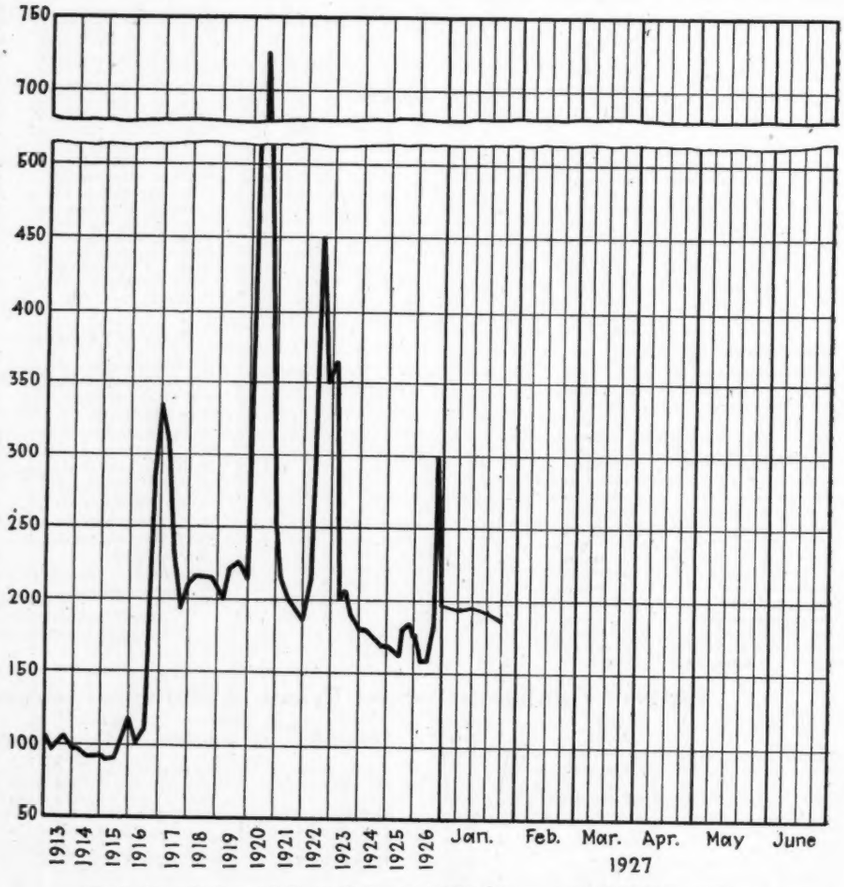
The interchange of coal loads through the Cincinnati gateway last week totaled 13,503 cars—an increase of 536 cars over the preceding week. The Louisville & Nashville was off 29 cars; the Chesapeake & Ohio gained 410 cars. The number of empties en route to the mines increased from 10,114 to 10,918 cars.

With weather conditions unfavorable to active domestic demand and steam buyers staying out of the market, conditions in Columbus have been spotty. Prices are unsteady. Stocking by large industrial consumers, public utilities and railroads has not attained sufficient momentum to be a real factor in shaping prices and production. While retailers are keeping up stocks, most of the replacement orders go to West Virginia and Kentucky. Some contract inquiries are circulating, but little actual business has been closed, as sellers demand higher prices on renewals.

Northern Ohio Trade Still Sags

Further softening was in evidence in northern Ohio last week. Slack and nut-and-slack sagged 10c. to 20c. per ton and all other grades also showed a tendency to weakness, with odd lots going at figures slightly under the prevailing market range. Railroads, utilities and large steam consumers are storing coal, but the rank and file of steam users are buying only for current needs. "No bills" of slack and nut-and-slack are plentiful. Production in the No. 8 field during the week ended Jan. 15 was 371,000 tons, or approximately 53 per cent of capacity. The retail trade at Cleveland is quiet.

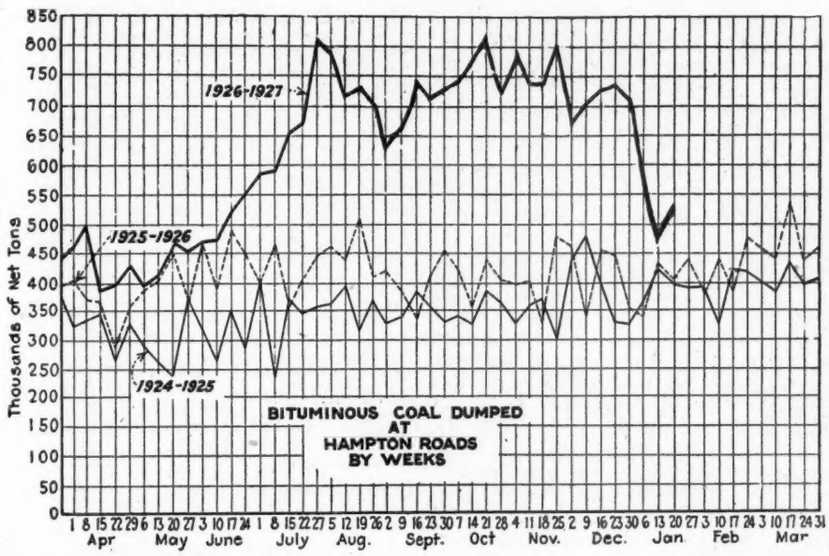
The unexpected action of the Pittsburgh Coal Co. in reducing wages to a $6 basis has further upset the west-



Coal Age Index of Spot Prices of Bituminous Coal F.O.B. Mines.

	1927				1926	1925
	Jan. 24	Jan. 17	Jan. 10	Jan. 3	Jan. 25	Jan. 26
Index	188	192	194	193	178	173
Weighted average price	$2.28	$2.33	$2.34	$2.33	$2.16	$2.09

This diagram shows the relative, not the actual, price on fourteen coals, representative of nearly 90 per cent of the bituminous output of the United States, weighted first with respect to the proportion each of slack, prepared and run-of-mine normally shipped, and second, with respect to the tonnage of each normally produced. The average thus obtained was compared with the average for the twelve months ended June, 1914, as 100, after the manner adopted in the report on "Prices of Coal and Coke: 1913-1918," published by the Geological Survey and the War Industries Board.


1926-1927
1925-1926
1924-1925
BITUMINOUS COAL DUMPED AT HAMPTON ROADS BY WEEKS
Thousands of Net Tons
Apr May June July Aug. Sept. Oct Nov. Dec. Jan Feb Mar

Car Loadings and Supply

	Cars Loaded — All Cars	Coal Cars
Week ended Jan. 8, 1927.....	940,800	214,176
Week ended Jan. 1, 1927.....	730,348	171,573
Week ended Jan. 16, 1926.....	936,655	192,820
Week ended Jan. 9, 1926.....	907,119	193,294

	Surplus Cars — All Cars	Coal Cars	Car Shortages — All Cars	Coal Cars
Jan. 8, 1927....	326,837	93,765	.....	.....
Dec. 31, 1926...	275,260	61,181	.....	.....
Jan. 7, 1926....	310,155	115,502	.....	.....

ern Pennsylvania market. Prices are working lower and with an increasing quantity of distress coal seeking a market the top figures of a few weeks ago have disappeared. Some steam lump has sold as low as $2. There is little talk of contract business and the bulk of the buying is for spot or short-term shipments.

As the time when the union wage contracts expire draws nearer, production in the central Pennsylvania region keeps pace with the tonnage rate of the last half of 1926. During the week ended Jan. 15 car loadings were 20,706 cars, as compared with 19,054 cars the preceding week. Except on wagon-mine coal offered for domestic consumption, prices show no real change; wagon-mine coal has dropped 50c.

In the Buffalo market bituminous lump is in short supply, but slack offerings are plentiful. Up to $4 is now asked for West Virginia smokeless lump, but central Pennsylvania low-volatile may be purchased as low as $2.25. In the high-volatile list, Youghiogheny gas slack has dropped to $1.65 @$1.75; Pittsburgh and No. 8 steam lump to $2@$2.25, and Allegheny Valley mine-run to $1.75@$2. The Toronto local market shows practically no change.

New England Trade Steady

The steam-coal market in New England continues about on the same level as for several weeks. Mild inquiry for spot coal together with a rather firm freight market coastwise is sustaining prices both at this end and at Hampton Roads. A fair volume is moving for export and consumers here are inclined this season to be somewhat more forehanded than is usual at the end of January, having an eye to possible developments after April 1. The medium to high grades of low-volatile are in good request at tidewater and it will be interesting to see if there is any material advance in price during February.

At Hampton Roads there is less accumulation than has been the rule since off-shore tonnage sloped off in November. The agencies are succeeding better in correlating supply with demand, although there are those in the trade who feel that quotations will hardly change much from the present basis.

Coals all-rail from central Pennsylvania are only in light demand. and then only within territory that may be regarded as outside the tidewater zone. There is some disposition to seek contracts, and on levels quite a bit lower than those named for spot shipment.

Although bituminous buying at New York does not appear active on the surface, considerable tonnage is moving. The market, however, still favors the buyer and bargain hunters are much in evidence. Sellers nevertheless are maintaining their quotations on the better grades, but most of the sales are made at figures midway between maximum and minimum quotations. Contract customers are taking their full tonnage quotas without special urging.

Buying for current consumption is satisfactory in the Philadelphia bituminous market and some storage tonnage also is being taken in. Many consumers, however, are neglecting their stockpiles in the hope that prices may work lower. The railroads appear to be the worst offenders in this respect. Contract buyers are demanding full shipments. Efforts to readjust wages have led to a number of shutdowns in the field.

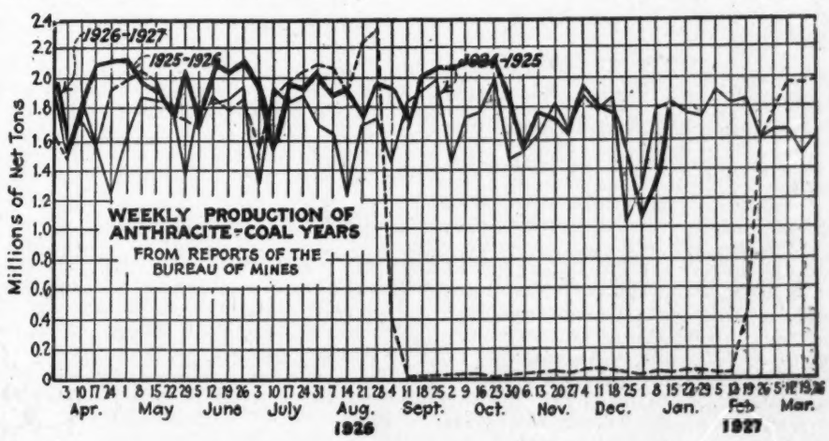
Except for the tag-end of the export business, soft-coal trading at Baltimore is largely featureless. Industries buy sparingly as transportation service is uninterrupted and competition between the sellers continues keen. Current quotations are uneven. The export trade, which held up remarkably well the first half of the month, flopped badly the past fortnight. No new charters have been reported and vessel rates are tumbling.

At Birmingham spot buying has improved very little, demand being comparatively light for all grades of steam coal. Washed coal and other prepared grades are selling better than mine-run, of which there is some surplus of the lower quality. Coal is moving well on contracts, but perhaps not quite to the extent that prevailed early in December. In the domestic market there is no insistent demand for any grade. There is no change in quotable prices f.o.b. mines.

Hard-Coal Trade Stronger

The domestic anthracite trade at New York showed more strength last week, with pea riding the crest of the upwave and egg not far behind. Stove and nut, on the other hand, were relatively inactive. There is considerable coal at the piers and at least one cargo of red-ash stove was sold, it is reported, on the basis of $10.25, mines. No. 1 buckwheat continues to gain. There is little free coal of first quality available and some independent tonnage is moving at $5. Rice and barley also are taking on new life.

Philadelphia found less cause for congratulation in domestic developments than New York. Demand is such that production has been curtailed at practically all mines. Retailers are anxious to turn present stocks into cash before ordering more coal. Pea is short, but demand is not heavy. The steam sizes are tighter, with some buckwheat selling at $3.50. The tonnage of steam coal available for spot sale is limited. Domestic demand at Baltimore is moderate. Weather has helped sales at Toronto, but the Buffalo market is dull.



Connellsville Coke Market Softens

The Connellsville coke region had been fully committed to a policy of maintaining the advanced wages of Nov. 1, except for the defections of a few small operators, but the Pittsburgh Coal Co.'s announcement of a reduction made it certain that a cut would be made. W. J. Rainey, Inc., immediately decided to reduce in proportion as the Pittsburgh Coal Co. had done, and at this writing the other merchant operators are practically certain to do the same, making the basic day rate $6. Doubt is entertained as to the independent steel companies operating in the region. The Frick company, of course, will not reduce, as it has held the high scale continuously since it was promulgated late in August, 1922, and some of the independent steel companies may stay with it.

The spot coke market promptly softened but it has not yet found a well defined level. Spot furnace coke is approximately $3.25, against $3.40@$3.65 previously. Spot foundry coke has remained dull and nominally is still quotable at $4.50@$5. Contracts will of course be adjusted in keeping with the wage change.

Production of beehive coke in the Connellsville and Lower Connellsville region during the week ended Jan. 15 was 133,780 net tons, according to the Connellsville *Courier*. Furnace-oven output was 58,800 tons, an increase of 6,400 tons from the preceding week. Merchant-oven output rose to 74,980 tons, 1,080 over the week before.

The Birmingham coke market is fairly good for foundry product, which is quoted at $6 per ton for spot and first quarter and $5.50 for first half. Domestic coke is in rather light demand on account of unseasonable weather conditions and enjoys only occasional spurts brought about by intermittent cold snaps. Egg is quoted at $5.25; stove, $4.75, and nut, $4.25 f.o.b. ovens.

Foreign Market And Export News

British Prices Still Sagging As Output Mounts

London, England, Jan. 14. — Coal prices in Wales have further declined due to the cautious policy of domestic and foreign buyers and also to competition. Since the beginning of the year operators' quotations for home sales have been reduced in most directions, but little business has resulted. There is a slightly better demand from the iron and steel and heavy engineering industries, particularly for coke. Export business is small and competition is keen. In addition, many shippers are holding arrears of old contracts and are underselling the collieries. Best Admiralty large is down to 27/— and 26/—. Small coals are 16/— to 17/—. The north of England market also is weak. Best steams are 20/—, steam smalls 12/— to 13/— and best unscreened bunkers are 20/—.

Production of coal for the week ended Jan. 1 amounted to 3,884,200 gross tons, or 96 per cent of the corresponding week of last year. A slight increase is shown in the number of miners employed, reaching 952,000.

Belgium Sees Price Dip When British Coal Floods Market

Brussels, Belgium, Jan. 6.—The Belgian coal market has not made any noticeable change, though various kinds of bituminous coals, chiefly those from the Borinage, show a weaker tendency. Some contracts for glass-making coals have been let at slightly decreased prices. Some of the collieries have signed long-time contracts that promise them an advantageous position for some months, but a decline must inevitably occur when Great Britain's production begins to flood the market. British prices are slightly higher than Belgian, but in February the conditions will doubtless be reversed.

Briquets also have softened in price, the ovoids particularly selling in smaller quantities. The foreign demand for ovoids is declining also. The general price is 186 fr. Coke prices are firm.

French Prices Must Fall, But Not Yet

Paris, France, Jan. 6.—The French market is still buoyant, but prices have been shaded a little to compete with British coal, at least in zones where the cross-seas product has the preference. Most French plants have become less active. Fuel consequently is in less urgent demand, but as stocks were low and the British operators not yet ready to slash prices to force the foreign markets, the French mine owners have decided to maintain their prices as on Jan. 1. Ovoids are from 440 to 460 fr. (as against 480 to 505). Welsh anthracite is again quoted; the price ranges between 703 and 723 fr. (nut) and 673 to 693 fr. (cobbles). Anthracites like those from Great Britain—these for the most part are merely Ruhr anthracite—sell for from 645 to 665 fr. for nuts and 620 to 640 for cobbles. Large briquets cost 460 fr. Russian anthracites are: For nut, 460 fr.; for cobbles, 450 fr., and for pea, 370 fr. f.o.t. Rouen.

Freights are unchanged, rates being somewhat more regular. Barges are plentiful and offers of traffic scarce. Bruay to Paris-Monnaie was quoted at 35 fr. per ton and Marles to Paris-Monnaie at 34 fr. At Rouen business was rather slack.

The Office for Foreign Coal received during the first 24 days of December 178,200 tons of coal, 177,800 tons of coke or altogether 356,000 tons.

Export Clearances, Week Ended Jan. 20

	Tons
FROM HAMPTON ROADS	
For Trinidad:	
Swed. Str. Thulin, for Port of Spain.	2,559
For France:	
Fr. Str. P. L. M. 24, for Marseilles.	7,701
Swed. Str. Oxelosund, for Havre....	7,384
Ital. Str. Emanuelle Accame, for Marseilles	11,203
Ital. Str. Mamore, for Marseilles....	12,338
For Cuba:	
Dan. Str. Nordstjernen, for Antilla..	3,364
Br. Str. Willowpark, for Cienfuegos..	2,064
For Martinique:	
Nor. Str. Edvard Munch, for Port de France	3,911
For Bermuda:	
Amer. Schr. Gladys M. Taylor, for Hamilton	1,381
Nor. Str. Marstenen, for St. George.	2,722
For Brazil:	
Braz. Str. Caxambu, for Rio de Janeiro	4,998
For Argentina:	
Br. Str. Pendeen, for Buenos Aires.	5,590
Br. Str. Chalton, for Buenos Aires..	5,575
For Canal Zone:	
Amer. Str. Steelore, for Cristobal....	8,646
Amer. Str. Bethore, for Cristobal...	9,052
For Portugal:	
Port. Str. Armante, for Lisbon.....	9,484
FROM BALTIMORE	
For United Kingdom:	
Br. Str. Gwynmead, for Queenstown, Ireland, for orders to England.	5,638
Span. Str. Aritz Mendi, for Queenstown, Ireland, for orders to England	2,407
Br. Str. Medomskey, for Queenstown, Ireland, for orders to England.	6,039
For Italy:	
Span. Str. Fernando, for Civitavecchia	5,758
Ital. Str. Chiabera, for Genoa.....	5,437
Br. Str. Hydaspes, for Genoa.....	5,255
Ital. Str. Pietro Campanella, for Leghorn	8,250
Ital. Str. Ansaldo San Giorgio Primo, for Genoa	6,578
For Argentina:	
Fr. Str. Union, for Buenos Aires....	6,925
For Cuba:	
Br. Str. Berwindmoor, for Havana..	9,301
For Brazil:	
Br. Str. Westlea, for Santos.....	6,488
Br. Str. Charlbury, for Santos.....	6,902
For Porto Rico:	
Am. Str. Millinocket, for Guayanillo	317
For Portugal:	
Port. Str. Cassaquel, for Lisbon....	6,431
FROM PHILADELPHIA	
For Cuba:	
Nor. Str. Felix, for Havana.....	——
For Italy:	
Ital. Str. M. T. Cicerone, for Savona.	——
For Brazil:	
Br. Str. Mariston, for Rio de Janeiro.	——

Hampton Roads Coal Dumpings*

(In Gross Tons)

	Jan. 13	Jan. 20†
N. & W. Piers, Lamberts Pt.:		
Tons dumped for week.....	187,093	197,231
Virginian Piers, Sewalls Pt.:		
Tons dumped for week.....	108,753	127,736
C. & O. Piers, Newport News:		
Tons dumped for week.....	135,113	154,215

*Data on cars on hand, tonnage on hand and tonnage waiting withheld due to shippers' protest.

Pier and Bunker Prices, Gross Tons

PIERS	Jan. 13	Jan. 20†
Pool 1, New York.....	$5.75@$6.00	$5.75@$6.00
Pool 9, New York.....	5.25@ 5.50	5.25@ 5.50
Pool 10, New York....	5.00@ 5.25	5.00@ 5.25
Pool 11, New York....	4.50@ 5.00	4.50@ 5.00
Pool 9, Philadelphia...	5.25@ 5.65	5.25@ 5.65
Pool 10, Philadelphia..	5.05@ 5.15	5.05@ 5.15
Pool 11, Philadelphia..	4.50@ 4.60	4.50@ 4.60
Pool 1, Hamp. Roads..	5.00	5.00
Pool 2, Hamp. Roads..	4.85	*4.75*
Pool 3, Hamp. Roads..	4.75	*4.50*
Pools 5-6-7, Hamp. Rds	4.75	*4.50*
BUNKERS		
Pool 1, New York.....	$6.00@$6.25	$6.00@$6.25
Pool 9, New York.....	5.50@ 5.75	5.50@ 5.75
Pool 10, New York....	5.25@ 5.50	5.25@ 5.50
Pool 11, New York....	4.75@ 5.25	4.75@ 5.25
Pool 9, Philadelphia...	5.50@ 6.10	5.50@ 6.10
Pool 10, Philadelphia..	5.30@ 5.40	5.30@ 5.40
Pool 11, Philadelphia..	4.75@ 5.05	4.75@ 5.05
Pool 1, Hamp. Roads..	5.10	5.10
Pool 2, Hamp. Roads..	4.95	*4.85*
Pools 5-6-7, Hamp.Rds.	4.85	*4.50*

† Advances over previous week shown in **heavy type**, declines in *italics*.